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Executive Summary of the Draft Environmental Impact Statement for Tusayan Growth

Kaibab National Forest

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EXECUTIVE SUMMARY
of
DRAFT ENVIRONMENTAL IMPACT STATEMENT
for
Tusayan Growth
Coconino County, Arizona

Lead Agency:	USDA, Forest Service Kaibab National Forest
Cooperating Agencies:	USDI, Grand Canyon National Park Coconino County Northern Arizona Council of Governments
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About the Executive Summary and the Draft EIS

Growth issues surrounding the Grand Canyon/Tusayan area have far reaching implications--for everyone from the nearby communities that rely on Grand Canyon tourism revenues, to the national and international visitors who value the Grand Canyon experience. This Executive Summary provides an overview of the draft Environmental Impact Statement which analyzes alternatives for addressing Tusayan growth issues.

The Executive Summary is divided into three sections. Section 1 discusses the underlying purpose and need for analyzing and trying to develop solutions for Grand Canyon/Tusayan area growth issues. In this section a brief background of the complex situation residents, land managers, business owners and visitors are grappling with is provided, as is an explanation of the existing and desired conditions for the area, and a full list of issues raised by the public and involved agencies about some proposed solutions. Section 2 highlights the alternatives that have been developed for consideration in addressing problems facing Grand Canyon/Tusayan. Section 3 provides important background information relating to the issues analyzed in the Environmental Impact Statement, and a summary of the potential environmental consequences of each of the proposed alternatives.

The Kaibab National Forest is the lead agency in this process and is responsible for the preparation of the Environmental Impact Statement and Executive Summary. Cooperating agencies who assisted with the Environmental Impact Statement preparation process are Grand Canyon National Park, Coconino County, and Northern Arizona Council of Governments.

Readers have the opportunity to comment on the information provided in this Executive Summary. A comment card is provided at the end of this document for that purpose. Please note that comments must be postmarked by the date stamped on the preceding page.

Copies of the draft Environmental Impact Statement can be reviewed at all northern Arizona community libraries; Kaibab National Forest offices and the Coconino National Forest Supervisor's Office; city offices; at Grand Canyon National Park; the Coconino County office; and the Northern Arizona Council of Governments headquarters. To request a copy of the Environmental Impact Statement, please call the Kaibab National Forest at (520) 635-8225.

Section 1: Purpose and Need For Action

Background

Grand Canyon National Park, designated a World Heritage site, is one of the most popular tourist destinations in North America. Nearly five million visitors enter the park each year. Although visitation fluctuates from year to year, it has increased by an average of 6% annually since 1985. As a consequence, many visitor, transportation, residential and community facilities within the park have reached, and in some cases have exceeded capacity. Demands to develop additional services are increasing as the number of visitors continues to rise. One of the largest issues facing land managers in the Grand Canyon area, which include the Forest Service, Park Service, and Coconino County, is how best to meet increasing visitor demands while protecting natural and cultural resources. The focus of the Tusayan Growth Environmental Impact Statement is on determining how best to provide for improvements to transportation, housing, community facilities, and visitor services in the Grand Canyon/Tusayan area using lands outside of park boundaries.

In 1995 the National Park Service adopted a General Management Plan outlining steps to alleviate problems facing the Grand Canyon area. The plan calls for the use of National Forest System lands near the park for solving problems related to housing and transportation. The General Management Plan envisions a transportation staging area near Tusayan where visitors to Grand Canyon will park their vehicles and board an inexpensive, convenient mass transit system into the park. The plan also calls for a cap on further development of visitor services within park boundaries. This places the focus on the use of National Forest System lands to address Park Service needs related to transportation, housing and visitor facilities.

Tusayan, an unincorporated tourist-oriented community about one mile south of the entrance to Grand Canyon National Park, consists largely of motels, restaurants, gift shops, campgrounds and grocery stores, and has continued to add visitor lodging, retail, and food and beverage services to support the expanding tourist market driven by increased park visitation. This growth has fueled a burgeoning and largely unmet demand for employee housing and community services and facilities in Tusayan. The Grand Canyon Improvement Association, a group of land and business owners in Tusayan, has expressed interest in expanding the community beyond its current boundaries. However, Tusayan is surrounded by the Tusayan Ranger District of the Kaibab National Forest, and expansion would require use of adjacent National Forest System land. The District continues to receive requests to use National Forest System land for utility corridors, and services and facilities to accommodate community growth. National Forest System land could be made available for planned community growth under a special-use permit or could be acquired under the Townsite Act or by land exchange for these uses, eliminating piecemeal requests.

The Tusayan Ranger District includes 21 private inholdings (privately owned parcels of land surrounded by National Forest System land). Twelve of these private inholdings are owned or controlled by a development corporation, Canyon Forest Village, which has proposed exchanging these lands to the Kaibab National Forest for National Forest System lands adjacent to Tusayan. If these inholdings remain in private ownership, they would be available for future development. Development of the private inholdings could increase management responsibilities and conflicts for the Forest Service, the National Park Service and Coconino County.

The Environmental Impact Statement process gives the Forest Service, Park Service, Coconino County, Northern Arizona Council of Governments and the public the opportunity to examine different ways for accommodating growth and expansion of visitor and community services, including transportation systems and housing, in the Grand Canyon/Tusayan area.

The Preferred Alternative and the Decision to be Made

After examining the alternatives for addressing Grand Canyon/Tusayan growth issues which are presented in the draft Environmental Impact Statement, the Forest Service will develop or identify a preferred alternative, or preferred course of action. This alternative may be one of the alternatives provided in the draft Environmental Impact Statement (and described in this Summary), or it may be a combination of elements from some or all of the alternatives. It's possible an entirely new alternative could be generated as the preferred alternative. The preferred alternative will be developed after the Forest has an opportunity to examine the comments provided on the draft Environmental Impact Statement, therefore a preferred alternative does not appear in the draft Environmental Impact Statement currently available for review. Following the release of the preferred alternative, the Forest will issue a Record of Decision for this analysis.

The decision to be made related to this Environmental Impact Statement is two-fold: 1) Whether or not to use National Forest System land for community expansion and additional visitor services and facilities, including the construction of a transportation staging area for Grand Canyon National Park visitors; and 2) if National Forest System land is to be so used, what method or combination of methods for acquiring use of National Forest System land best meets the needs of the area.

Existing Situations and Desired Conditions

Existing Situations describe the current conditions. Following is a brief description of the existing situation facing Grand Canyon/Tusayan area residents, land managers, business owners and visitors. The Desired Conditions that follow, reflect the achievement of an optimal set of conditions. These Desired Conditions were identified by the Kaibab National Forest, Grand Canyon National Park, Coconino County and Northern Arizona Council of Governments.

Existing Situation

- Tusayan is a 144-acre island of private land surrounded by National Forest System land. Expansion of the community beyond its present boundaries will require use of National Forest System land.

- Several private inholdings within the Tusayan Ranger District of the Kaibab National Forest are owned or controlled by Canyon Forest Village and are believed to have development potential because of their proximity to Grand Canyon National Park and State Highway 64 (Figure 1). The development of these inholdings could impact the management of adjacent National Forest System and National Park Service lands and create additional stress on county provided services.

- The permanent population of Tusayan and Grand Canyon Village is about 2300, and climbs to about 3200 in the summer months.

- Housing for area residents is in short supply and is often of poor quality. Because housing in Tusayan is generally provided by employers, when jobs end, employees risk losing their housing accommodations. While residentially zoned land exists in Tusayan, development of "open market" housing has not been feasible because of high land and development costs.
- Almost all community services serving this population are located in Grand Canyon National Park, in Grand Canyon Village. These include the school, medical

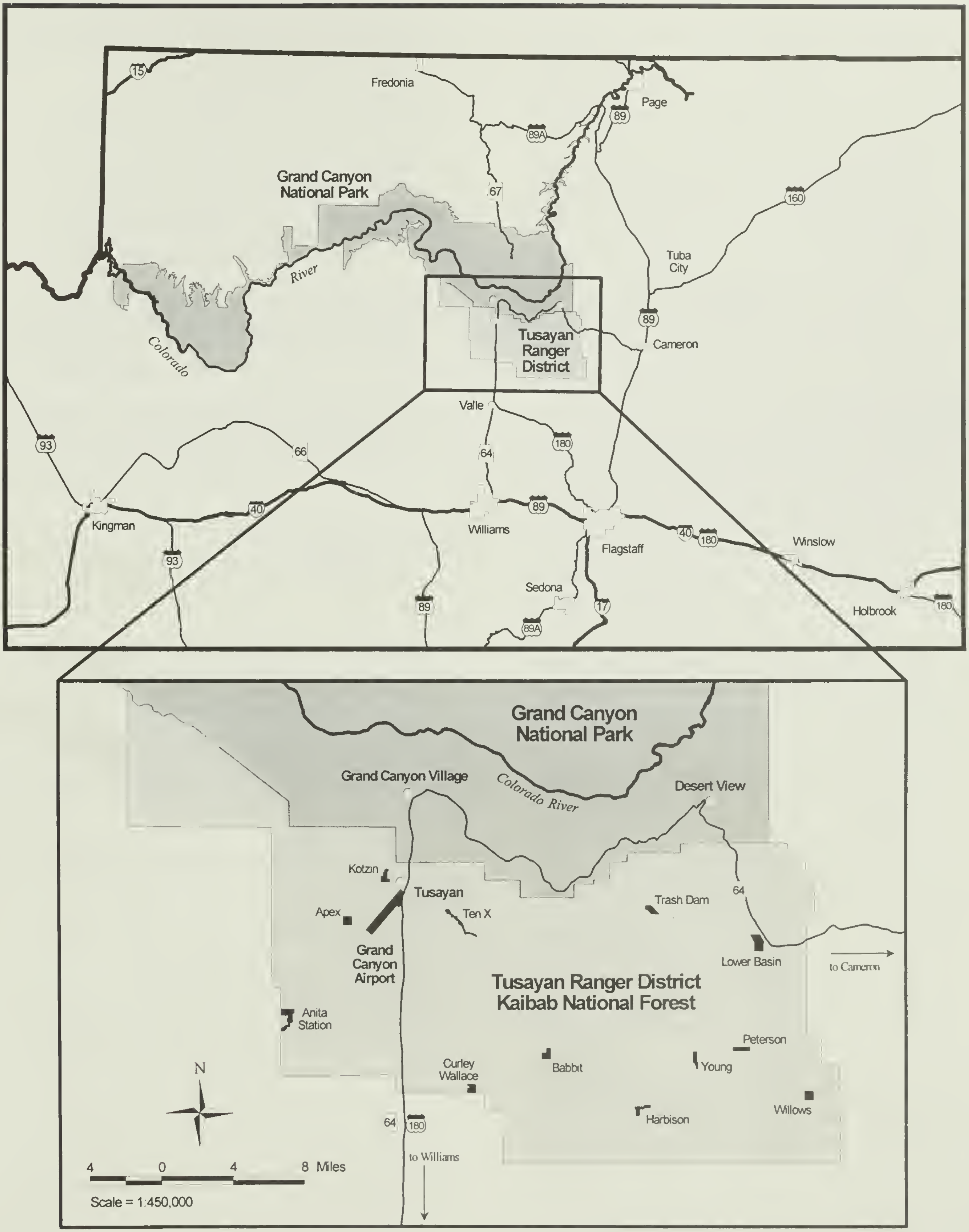

Figure 1. Tusayan Ranger District and Private Inholdings Involved in Analysis

clinic, recreational facilities, a shared house of worship, day care facility, etc.

- Visitors to Grand Canyon National Park number five million a year. Visitation projections for 2010 are in the range of 6.8 to 11 million.

- 78% of visitors access the park in private vehicles, leading to traffic congestion and parking problems. Other transportation modes are not well developed or easy to use.

- Grand Canyon Village offers limited food and beverage services for visitors. This results in long lines and delays for visitors especially during peak visitor periods.

Desired Conditions

- The land ownership pattern within the Tusayan Ranger District allows for efficient and effective management of public and private lands. Undeveloped private inholdings with important natural and cultural resource values have been acquired by the Forest Service. Development of private lands is consistent with the management objectives of the Kaibab National Forest, Grand Canyon National Park, and Coconino County.

- Up to 500 housing units are provided near the park to house National Park Service and park concessionaire employees who cannot be accommodated inside park boundaries. These units are adjacent to Tusayan and include a range of housing types and densities.

- Residential housing is located in a single area, with community facilities and services in close proximity. Additional housing is provided for new employees who may come to the area in the future.

- Community facilities and services are developed in Tusayan in a coordinated, planned fashion. Such facilities and services include additional schools, a day-care center, places of worship, and medical facilities; community parks, recreation centers, and playgrounds; and laundromats, banks, and grocery/supply stores.

- Grand Canyon Village continues to provide services for the in-park community. Expansion of these facilities occurs outside the park, as does development of any new community facilities that are needed to serve an increased resident population.

- Grand Canyon National Park works with area partners to develop a transportation staging area south of the park and north of Tusayan. The staging area is the primary site at which visitors leave their vehicles and access a mass transit service to the park.

- Transit service, hiking, and biking are the primary year-round modes of travel for park visitors and residents along the South Rim. Most cars are excluded from Grand Canyon Village.

- Overnight accommodations are in locations that meet the expectations, needs and preferences of visitors.

- Circulation patterns in Grand Canyon Village are organized so that visitors have convenient access to the rim, can easily learn about park themes, and can obtain a diversity of visitor services without long waits.

- Additional food and beverage facilities both inside and outside the park accommodate peak demand. Visitors can choose from a variety of dining experiences.

Project Objectives

Based on the desired conditions, the Interdisciplinary Team developing the Environmental Impact Statement has identified three project objectives which are to examine:

1) Land ownership patterns that allow for efficient and effective management of public and private lands;

2) Ways to facilitate coordinated development of community (e.g., housing, school, houses of worship, day care, community center, etc.) and visitor (e.g., guest lodging, retail, food and beverage) services and facilities in the Grand Canyon/Tusayan area; and

3) Locations and concepts for a transportation staging area and orientation center for visitors to Grand Canyon National Park.

Public Scoping and Issues

The Kaibab National Forest initiated public scoping in November 1993 for this analysis by soliciting comments on the proposed Tusayan Land Exchange (the initial proposal the Forest received which triggered the beginning of the Tusayan Growth Environmental Impact Statement process). Comprehensive measures were taken to reach the public with word of the proposed action and a preliminary list of resource-related issues. In deciding what topics to address in the Environmental Impact Statement, the Interdisciplinary Team gave serious consideration to the comments generated by individuals, organizations, and agencies. The issues that emerged are listed below.

- Development of private or National Forest System land would increase demand for water.

- Additional groundwater pumping in the Grand Canyon/Tusayan area for new development could affect aquifer flow dynamics and could affect spring flow and other water-related uses and values in Grand Canyon National Park and on tribal land.

- Increased hauling of water from surrounding areas construction of pipelines to transport water from distant sources could affect highway safety, and natural and cultural resources.

- Additional commercial development in the Grand Canyon/Tusayan area could affect revenues for existing businesses in the Grand Canyon/Tusayan area through increased competition.

- Large-scale development in the Tusayan area could negatively impact the economic base for a number of northern Arizona communities through the loss of Grand Canyon tourist revenue.

- There is a need for additional housing for Federal and concessionaire employees within Grand Canyon National Park and for employees of Tusayan businesses. Issues include who would build the housing, who would pay for the housing to be built, how many units would be provided, what types of housing would be provided, and what distribution of housing types and affordability will be offered.

- Development near Tusayan may provide additional employment opportunities.

- Additional population growth and visitation resulting from development could increase crime rates in the Grand Canyon/Tusayan area.

- As Tusayan grows and visitation to the park increases, the need to expand existing facilities or provide new facilities for schools, police and fire protection, medical services, and other community services will increase.

- Development of private or National Forest System land near Tusayan could affect the visitor experience resulting from further urbanization near the park boundary.

- The level of proposed development in the Tusayan area along State Highway 64 may increase, altering visual conditions along the highway.

- The development of the private inholdings under consideration for acquisition represents a change in the landscape that may be visible to Kaibab National Forest and Grand Canyon National Park visitors.

- Additional development of private and National Forest System lands near Tusayan could result in a change in vehicle-emitted air pollution, affecting visibility in Grand Canyon National Park.

- Commercial and community growth in the Tusayan area may create additional light pollution for visitors looking across the canyon from the North Rim and for backcountry users at Grand Canyon National Park. It could also diminish night-sky visibility for visitors and residents in Grand Canyon National Park, the Kaibab National Forest, and Tusayan.

- Additional development in the Tusayan area may increase noise associated with residential use, local traffic, mass transit, and air traffic in the Grand Canyon/Tusayan area.

- Development of private or National Forest System land near Tusayan could affect management of Grand Canyon National Park.

- The average length of visitor stay may increase, which could increase use of Grand Canyon National Park facilities, services, and resources.

- Development of private or National Forest System land near Tusayan could affect traffic patterns and congestion in Grand Canyon National Park and in the Tusayan area.

- Development of private or National Forest System land near Tusayan would require a specific plan that includes assurances that what is analyzed and proposed for development will actually be built and that development, mitigation and monitoring commitments would be carried out during implementation.

- Development of private or National Forest System land near Tusayan could impact archaeological sites, traditional cultural properties of local and regional American Indian tribes, and historic resources associated with railroad, logging, and livestock operations.

- Development of private or National Forest System land could affect the types and acreage of vegetation occurring on the Forest.

- Development of private or National Forest System land could affect known deer-fawning, elk-calving, and turkey-roosting habitat, as well as other wildlife habitat areas in the vicinity. It could also affect nearby wildlife movement corridors and would likely increase human disturbance of these and other wildlife populations near National Forest System lands.

- Development of the private or National Forest System land may affect populations of Threatened, Endangered, or Sensitive plants and/or animals.

- Development of the private or National Forest System land may affect the management efficiency of natural resources and land uses by the Kaibab National Forest.

- Development of the private or National Forest System land near Tusayan may affect recreational opportunities in the area.

- Development of private or National Forest System land near Tusayan may affect the amount of wildland/urban interface and increase fire risk. This may affect fire suppression efficiency.

Each of these issues are fully analyzed in the draft Environmental Impact Statement. In Section 3 of this Executive Summary, a comparison table demonstrates the anticipated effect each alternative would have on the above mentioned issues.

Section 2: Understanding the Alternatives

Five alternatives are considered in detail in the draft Environmental Impact Statement as possible approaches to dealing with the problems facing the Grand Canyon/Tusayan area. The alternatives are: Alternative A: No Action; Alternative B: Land Exchange Option 1; Alternative C: Land Exchange Option 2; Alternative D: Townsite Act/Special Use Permit; and Alternative E: Transportation/Federal Housing. Alternatives B, C, and D are proponent derived. The two proponents (Canyon Forest Village for Alternatives B and C and Grand Canyon Improvement Association for Alternative D) submitted detailed plans to the Forest Service for review by the Interdisciplinary Team. During this review, the Interdisciplinary Team examined the legal, economic, and technical adequacy of the proposals. The description of alternatives presented here was derived from information provided by the proponents. The five alternatives are briefly described below and a detailed comparison of each is provided in Table 1.

Concurrent with the Environmental Impact Statement process, there is an ongoing appraisal by an independent professional land appraiser of the Federal and private land involved in the alternatives. Based on the results of the appraisal process, adjustments may be made in the amount of Federal land, or in the amount of private land proposed for trade in the land exchange alternatives to ensure equal value of the Federal and private land. The appraisal will also determine the value of the Federal land specified for acquisition under the Townsite Act, and will serve as the basis for the fee structure for the transportation staging area in the alternatives that authorize this facility under special use permit. This appraisal is being completed according to specified Federal standards.

Under the No Action alternative **(Alternative A)**, acquisition of National Forest System land through either land exchange or Townsite Act would not take place. National Forest System land would not be used for community development, employee housing, or a transportation staging area as part of this National Environmental Policy Act (NEPA) process. Inholdings on the Tusayan Ranger District would remain in private ownership and would be subject to future development. Development could also occur in Tusayan , on State trust land, on tribal land, and in other communities. The No Action alternative provides a benchmark that can be used to compare the magnitude of impacts of the other alternatives.

Alternatives B and C are land exchange alternatives involving private acquisition of National Forest System land directly north of Tusayan in exchange for Federal acquisition of 12 private inholdings on the Tusayan Ranger District of the Kaibab National Forest. Additional private land may be secured by the proponent (Canyon Forest Village), or adjustments made in the size of the Federal tract to equalize values of land exchanged based on the results of the ongoing land value appraisals. Under both of these alternatives, the National Forest System land acquired by the proponent would be developed for visitor and community facilities and services and would include a transportation staging area and an educational/interpretive center. Income generated by these services would subsidize community development such as housing, schools, houses of worship, fire protection, and law enforcement. Alternative C provides for the conveyance of a smaller tract of Federal land into private ownership (380 acres instead of 672 as proposed under Alternative B) and would reduce the number of visitor accommodations and retail operations than that proposed under Alternative B. The mix of community facilities provided under both alternatives is generally similar (Figures 2 and 3).

Under the Townsite Act/Special Use Permit alternative **(Alternative D)**, proposed by the Grand Canyon Improvement Association, a local government entity would purchase National Forest System land north of Tusayan (Figure 4), for employee housing and community needs and the Kaibab National Forest would issue a special use permit for the construction and operation of a transportation staging area. An orientation/interpretive facility would be provided on private land within the community of Tusayan, along with the redevelopment of commercial properties in Tusayan.

Under the Transportation/Federal Housing alternative **(Alternative E)**, the Kaibab National Forest would provide land for National Park Service employee housing and would issue a special use permit for construction and operation of a transportation staging area directly north of Tusayan (Figure 5). This alternative would not involve a land exchange or Townsite Act acquisition, and National Forest System land to be used for Federal employee housing and a transportation area would remain under Federal ownership.

Common Elements

There are some elements, or actions, that are common to the alternatives. Some of these elements include the No Action alternative, while others involve only the action alternatives. These elements are independent of the alternatives and are likely to occur regardless of which alternative is selected.

The following elements are common to all alternatives, including No Action.

- Potential construction of up to 661 visitor lodging units in the Grand Canyon/Tusayan area:

Location	**Number of Lodging Units**
Moqui Lodge	221
Grand Canyon National Park Lodges	240
Domes Property	200
	661

- The GCIA has proposed redevelopment of several private properties in Tusayan to provide additional visitor services. This redevelopment is proposed as a component of Alternative D, but is expected to occur to a certain degree under all of the alternatives. Redevelopment is contingent on receiving necessary zoning changes from the Coconino County Board of Supervisors. Redevelopment in Tusayan would include up to:
    - 710 new lodging units
    - 80,000 square feet of new retail
    - 132,000 square feet of new food and beverage services

- Compliance with all applicable Federal, state, and local laws, regulations, and ordinances, including requirements for safety, accessibility, health, environmental protection, air and water quality, and energy conservation

- Compliance with the Tusayan Area Plan ?

The elements listed below apply to all of the action alternatives (excluding No Action).

- Development of a transportation staging area near Tusayan to alleviate traffic congestion at the South Rim of Grand Canyon National Park

- Provision of housing for Federal employees of Grand Canyon National Park

- Development of information and orientation facilities and services for Grand Canyon National Park visitors near the transportation staging area

Table 1 provides a description of each alternative, based on the five primary components of the purpose and need for this analysis: Land Ownership Management, Transportation, Employee Housing, Community Infrastructure, and Visitor Services and Facilities.

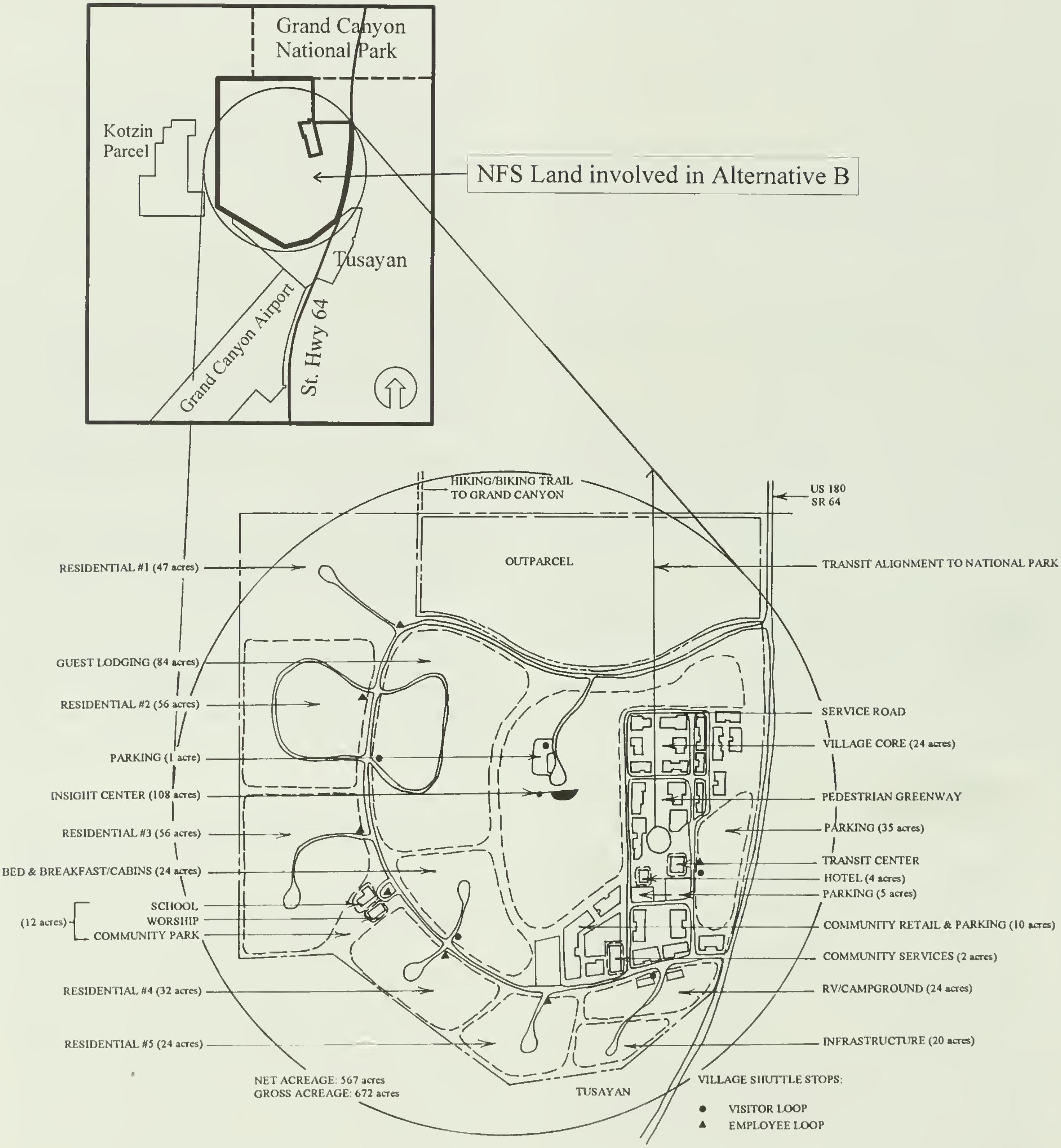
Grand Canyon National Park
Kotzin Parcel
NFS Land involved in Alternative B
Tusayan
Grand Canyon Airport
St. Hwy 64
HIKING/BIKING TRAIL TO GRAND CANYON
US 180 SR 64
OUTPARCEL
TRANSIT ALIGNMENT TO NATIONAL PARK
RESIDENTIAL #1 (47 acres)
GUEST LODGING (84 acres)
RESIDENTIAL #2 (56 acres)
PARKING (1 acre)
INSIGHT CENTER (108 acres)
RESIDENTIAL #3 (56 acres)
BED & BREAKFAST/CABINS (24 acres)
(12 acres)
SCHOOL
WORSHIP
COMMUNITY PARK
RESIDENTIAL #4 (32 acres)
RESIDENTIAL #5 (24 acres)
SERVICE ROAD
VILLAGE CORE (24 acres)
PEDESTRIAN GREENWAY
PARKING (35 acres)
TRANSIT CENTER
HOTEL (4 acres)
PARKING (5 acres)
COMMUNITY RETAIL & PARKING (10 acres)
COMMUNITY SERVICES (2 acres)
RV/CAMPGROUND (24 acres)
INFRASTRUCTURE (20 acres)
NET ACREAGE: 567 acres
GROSS ACREAGE: 672 acres
TUSAYAN
VILLAGE SHUTTLE STOPS:
● VISITOR LOOP
▲ EMPLOYEE LOOP

Figure 2. Concept Plan proposed under Alternative B.

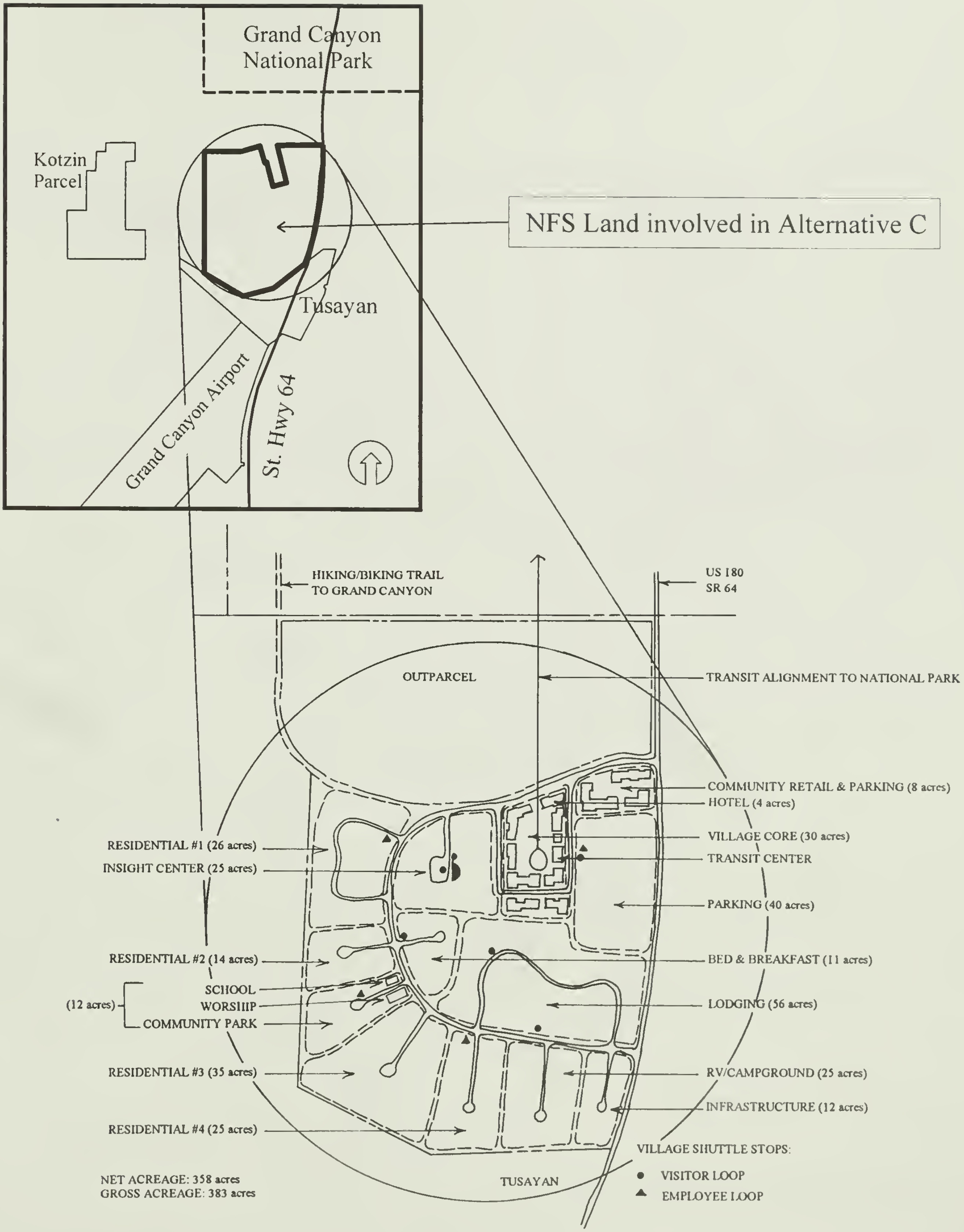
Grand Canyon National Park
Kotzin Parcel
NFS Land involved in Alternative C
Tusayan
Grand Canyon Airport
St. Hwy 64
HIKING/BIKING TRAIL TO GRAND CANYON
US 180
SR 64
OUTPARCEL
TRANSIT ALIGNMENT TO NATIONAL PARK
COMMUNITY RETAIL & PARKING (8 acres)
HOTEL (4 acres)
VILLAGE CORE (30 acres)
TRANSIT CENTER
PARKING (40 acres)
BED & BREAKFAST (11 acres)
LODGING (56 acres)
RV/CAMPGROUND (25 acres)
INFRASTRUCTURE (12 acres)
RESIDENTIAL #1 (26 acres)
INSIGHT CENTER (25 acres)
RESIDENTIAL #2 (14 acres)
(12 acres)
SCHOOL
WORSHIP
COMMUNITY PARK
RESIDENTIAL #3 (35 acres)
RESIDENTIAL #4 (25 acres)
NET ACREAGE: 358 acres
GROSS ACREAGE: 383 acres
TUSAYAN
VILLAGE SHUTTLE STOPS:
● VISITOR LOOP
▲ EMPLOYEE LOOP

Figure 3. Concept Plan proposed under Alternative C.

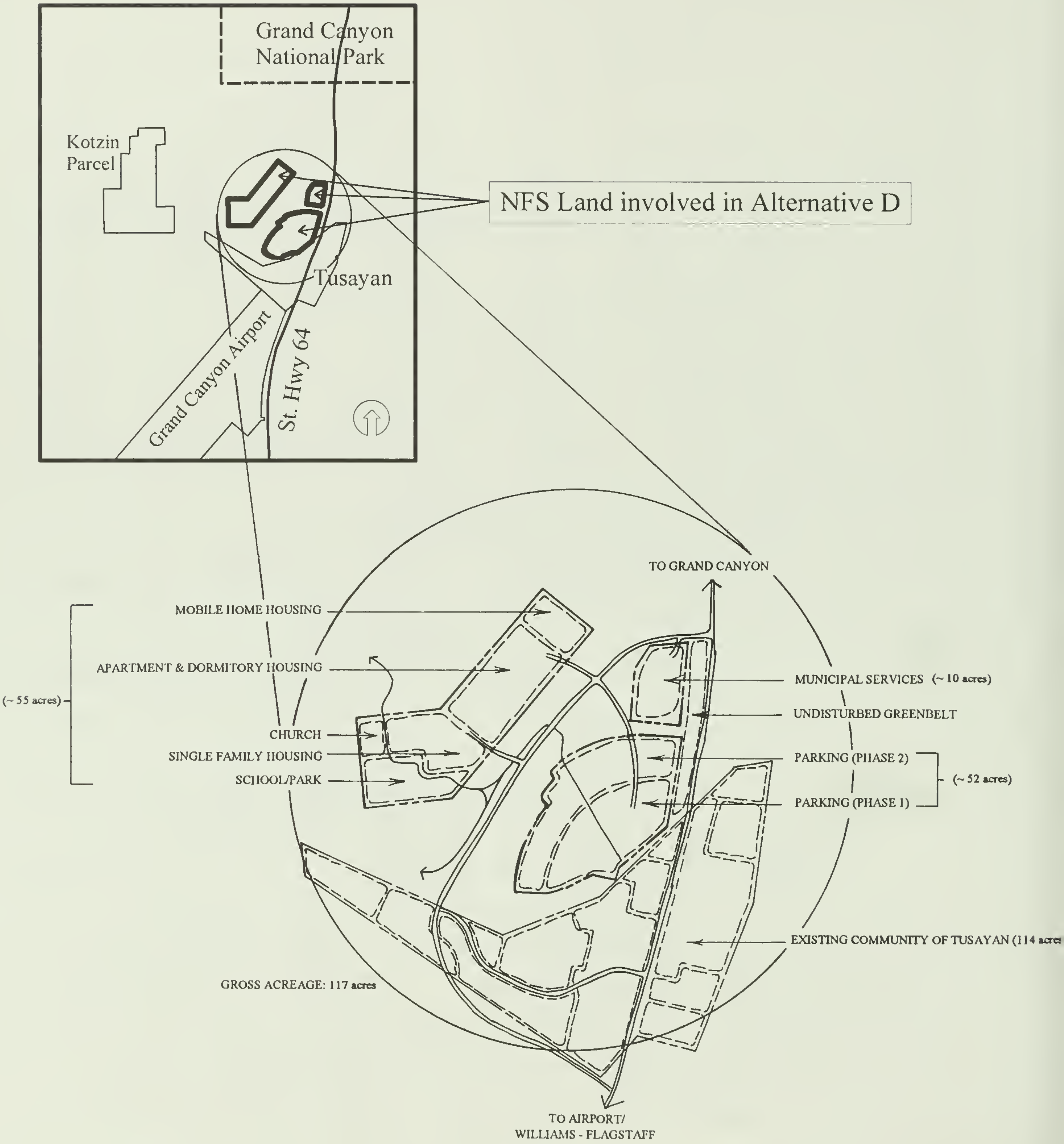

Figure 4. Concept Plan proposed under Alternative D.

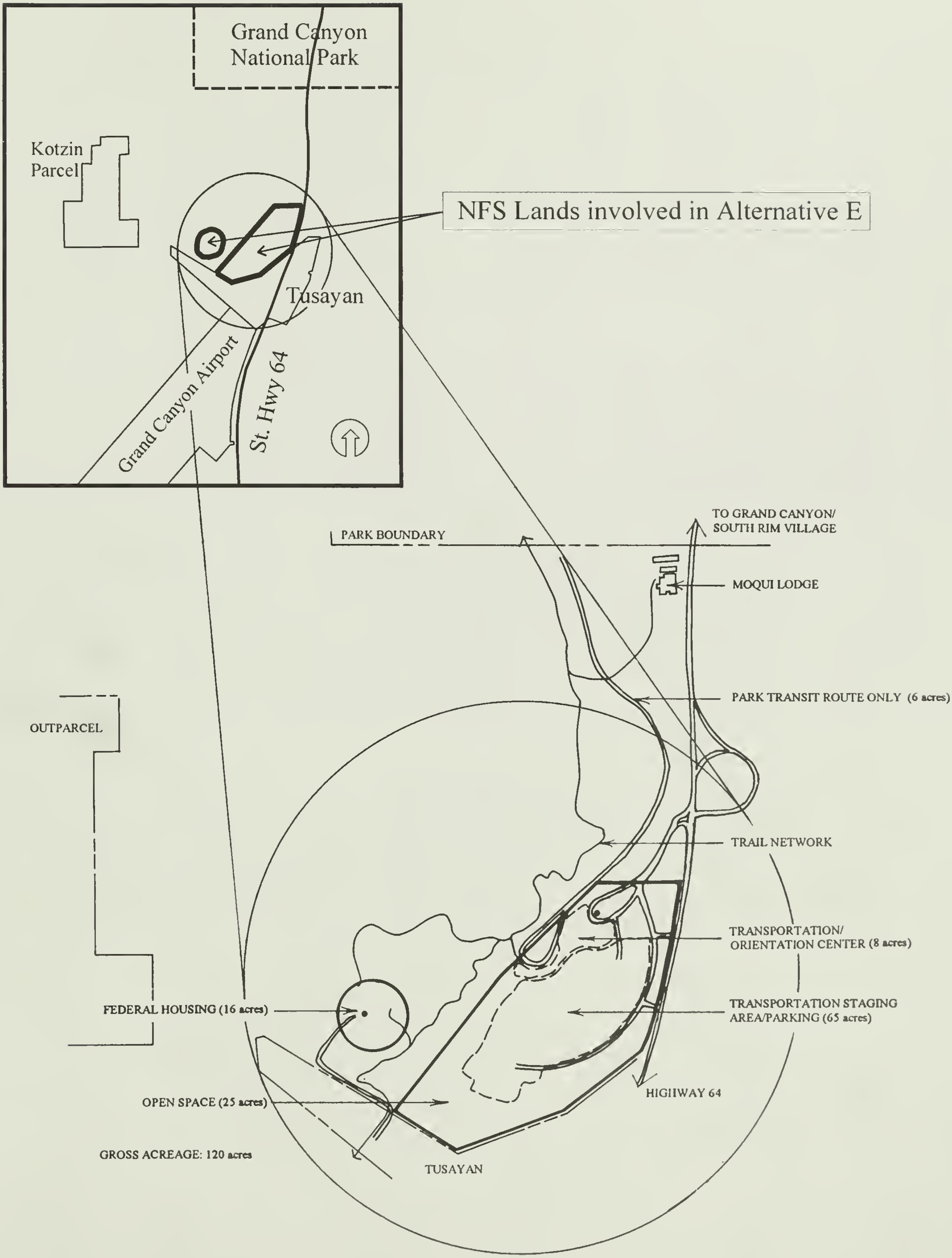
Grand Canyon National Park
Kotzin Parcel
NFS Lands involved in Alternative E
Tusayan
Grand Canyon Airport
St. Hwy 64
TO GRAND CANYON/ SOUTH RIM VILLAGE
PARK BOUNDARY
MOQUI LODGE
PARK TRANSIT ROUTE ONLY (6 acres)
OUTPARCEL
TRAIL NETWORK
TRANSPORTATION/ ORIENTATION CENTER (8 acres)
FEDERAL HOUSING (16 acres)
TRANSPORTATION STAGING AREA/PARKING (65 acres)
OPEN SPACE (25 acres)
HIGHWAY 64
GROSS ACREAGE: 120 acres
TUSAYAN

Figure 5. Concept Plan proposed under Alternative E.

Table 1 Comparison of Alternatives

Components of Purpose and Need	Alternatives				
	Alternative A: *No Action*	*Alternative B:* *Land Exchange Option 1* **Proponent: CFV**	*Alternative C:* *Land Exchange Option 2* **Proponent: CFV**	*Alternative D:* *Townsite Act/Special Use Permit* **Proponent: GCIA**	*Alternative E:* *Transportation/ Federal Housing*
Land Ownership Management	•National Forest System (NFS) land would remain in Federal ownership •Private inholdings would remain in private ownership	•672 acres of NFS land located directly north of Tusayan would be exchanged into private ownership •12 private inholdings totaling 2,184 acres within the Tusayan Ranger District would be acquired by the Kaibab National Forest (KNF) •The land exchange is completed on the basis of equal value of lands exchanged. The Forest Service is completing an appraisal to determine land value. Additional private land may be secured by Canyon Forest Village (CFV), or adjustments may be made in the size of the NFS land, to equalize the value of lands being exchanged based on the results of the appraisal.	•380 acres of NFS land located directly north of Tusayan would be exchanged into private ownership •12 private inholdings totaling 2,184 acres within the Tusayan Ranger District would be acquired by the KNF •The land exchange is completed on the basis of equal value of lands exchanged. The Forest Service is completing an appraisal to determine land value. Additional private land may be secured by CFV, or adjustments may be made in the size of the NFS land, to equalize the value of lands being exchanged based on the results of the appraisal.	•County Improvement District formed to purchase 65 acres of NFS land under the Townsite Act for public housing and community services and facilities •52 acres of NFS land designated for use as a transportation staging area authorized by special use permit •Private inholdings remain in private ownership	•NFS land would remain in Federal ownership •16 acres of NFS land used to build Federal employee housing under a Memorandum of Understanding between United States Department of Agriculture (USDA) and United States Department of the Interior (USDI) •80 acres of NFS land designated for use as a transportation staging area authorized by special use permit •Private inholdings remain in private ownership

Components of Purpose and Need	**Alternatives**				
	Alternative A: ***No Action***	***Alternative B:*** ***Land Exchange Option 1*** **Proponent: CFV**	***Alternative C:*** ***Land Exchange Option 2*** **Proponent: CFV**	***Alternative D:*** ***Townsite Act/Special Use Permit*** **Proponent: GCIA**	***Alternative E:*** ***Transportation/ Federal Housing***
Transportation System	•No designated transportation staging area would be built near Tusayan on NFS land •Possible construction of Grand Canyon Railway Spurline that could transport a maximum of 1 million visitors per year from Grand Canyon Airport to Maswik Transportation Center at Grand Canyon National Park (GCNP) •Possible use of spurline parking and depot facilities for additional mass transit systems (i.e. buses) offering access to GCNP	•A transportation staging area would be constructed on NFS land acquired through exchange in the southern part of the proposed development to implement a mass transit system for GCNP •The parking facility would be built in phases to reach a designed capacity of 8,000 to 10,000 vehicles •Two internal shuttle systems, a resident and visitor shuttle, would operate in the CFV development •Trail system for hiking/ biking would be constructed between the CFV development and GCNP	•A transportation staging area would be constructed on NFS land acquired through exchange in the northern part of the proposed development to implement a mass transit system for GCNP •The parking facility would be built in phases to reach a designed capacity of 6,000 to 8,000 vehicles •Two internal shuttle systems, a resident and visitor shuttle, would operate in the CFV development •Trail system for hiking/ biking would be constructed between the CFV development and GCNP	•A transportation staging area would be constructed north and adjacent to IMAX theater on NFS land under a special use permit from KNF •The parking facility would accommodate 4,500 vehicles. Should additional parking be needed in the future, it would be pursued under a separate action •An internal shuttle system would operate between Tusayan and the residential area to shuttle employees to and from work	•A transportation staging area would be constructed directly north of Tusayan on NFS land under a special use permit from KNF •The parking facility would accommodate 4,500 vehicles. Should additional parking be needed in the future, it would be pursued under a separate action •Trail system for hiking/ biking would be constructed between the transportation staging area and GCNP

Components of Purpose and Need	**Alternatives**				
	Alternative A: *No Action*	*Alternative B:* *Land Exchange Option 1* **Proponent: CFV**	*Alternative C:* *Land Exchange Option 2* **Proponent: CFV**	*Alternative D:* *Townsite Act/Special Use Permit* **Proponent: GCIA**	*Alternative E:* *Transportation/ Federal Housing*
Employee Housing	•No housing is proposed on NFS land, or using Federal funds on other land •Housing for park employees could be provided by the private sector on the private inholdings or in the outlying communities of Valle, Williams, and Flagstaff •As required by the Tusayan Area Plan, employers must provide housing for new employees generated by redevelopment of Tusayan, or potential development of the private inholdings	•Housing includes 310 single-family, 1,045 apartment, and 1,220 dormitory units •Housing is designated for: CFV (1,680 units), GCNP (400 units), Tusayan (495 units) employees •Housing cost: Single-family would sell for $60,000 to $110,000, apartments would rent for $640/month, and dormitories would rent for $455/month. Housing costs will be subsidized by fees assessed to commercial property owners •Canyon Forest Village Council formed to establish rental rates and resident eligibility to ensure housing is affordable and available	•Housing includes 270 single-family, 945 apartment and 860 dormitory units •Housing is designated for: CFV (1,075 units), GCNP (400 units), Tusayan (475 units) •Housing cost: Single-family would sell for $65,000, apartments would rent for $640/month, and dormitories would rent for $455/month. Housing costs will be subsidized by fees assessed to commercial property owners •Canyon Forest Village Council formed to establish rental rates and resident eligibility to ensure housing is affordable and available	•Housing would be constructed on land acquired under the Townsite Act •County Improvement District would sell land to Public Housing Authority to build housing •Housing includes 270 single family, 424 mobile homes/ apartment, and 122 dormitory units •Housing available to all area residents but earmarked for: GCNP (377 units), Tusayan (539 units) •Housing cost: Single-family would rent for $375/month, apartments would rent for $223/month, and dormitories would rent for $180/month. Subsidy structure for public housing has not been developed. •Public Housing authority formed to establish rental rates and resident eligibility to ensure housing is affordable and available	•Housing would be constructed on NFS land through execution of a Memorandum of Understanding between the USDA and USDI •Housing includes 20 duplex, 38 apartment, and 42 dormitory units •Housing would be available for Federal employees only •No private sector housing proposed on NFS land •Rental rates for Federal housing complex would be established using a government formula if construction is funded by the Federal government; rental rates would be based on market conditions if construction is funded by a private developer.

Components of Purpose and Need	**Alternatives**				
	Alternative A: *No Action*	*Alternative B:* *Land Exchange Option 1* **Proponent: CFV**	*Alternative C:* *Land Exchange Option 2* **Proponent: CFV**	*Alternative D:* *Townsite Act/Special Use Permit* **Proponent: GCIA**	*Alternative E:* *Transportation/ Federal Housing*
Community Infrastructure	•Community services and facilities in GCNP would continue to serve resident population of Tusayan and GCNP. No expansion of these services or facilities is planned in GCNP General Management Plan (GMP) •The construction of additional community facilities and services in Tusayan, or potentially on the private inholdings would be at the landowners' discretion	•CFV would design, finance, and build parks, a community center, library, fire station, sheriff's office, post office, and day care facility •CFV would provide a one million dollar school grant and would donate land for a school site, with infrastructure •CFV would construct infrastructure and make sites available for primary health care provider, and houses of worship •120,000 square feet (sq. ft.) of community retail, including laundromat, car wash, video rental, salon, hardware, etc., plus 55,000 sq. ft. of improved pads for other community retail	•CFV would design, finance, and build parks, a community center, library, fire station, sheriff's office, post office, and day care facility •CFV would donate land for school site, with infrastructure •CFV would construct infrastructure and make sites available for primary health care provider, and a shared house of worship •80,000 sq. ft. of community retail, including laundromat, car wash, video rental, salon, hardware, etc., plus 44,000 sq. ft. of improved pads for other community retail	•County Improvement District would make land available for purchase by other governmental entities to build community services and facilities (e.g., school district, fire district) •Governmental entity would raise funds to build facilities •Proposed facilities include school site, fire station, and community center •Community center to house medical center, sheriff's office, chamber of commerce. American Legion and other service organizations •No specified community retail is proposed; however, some area residents may use visitor retail associated with redevelopment of Tusayan	• A multipurpose room would be built and include a large hall for meeting and worship services, full-service kitchen, day care facility, crafts room, resource center, administrative offices, and other support facilities for residents of Federal housing complex only

Components of Purpose and Need	Alternatives				
	Alternative A: *No Action*	*Alternative B:* *Land Exchange Option 1* **Proponent: CFV**	*Alternative C:* *Land Exchange Option 2* **Proponent: CFV**	*Alternative D:* *Townsite Act/Special Use Permit* **Proponent: GCIA**	*Alternative E:* *Transportation/ Federal Housing*
Visitor Services and Facilities	•Development of private land in Grand Canyon/Tusayan area is contingent on zoning approvals from Coconino County •Visitor services and facilities provided with redevelopment of Tusayan, and potentially with development of private inholdings controlled by CFV, and other surrounding communities, tribal land, state trust land •Potential development of two orientation/interpretive centers; one with redevelopment of Tusayan, and one with potential development of private inholdings controlled by CFV	•3,650 guest lodging units, 250 campground/RV sites •250,000 sq. ft. of retail including restaurants, shops, and services •Development of INSIGHT in conjunction with Museum of Northern Arizona	•2,000 guest lodging units, 250 campground/RV sites •180,000 sq. ft. of retail including restaurants, shops, and services •Development of INSIGHT in conjunction with Museum of Northern Arizona	•710 additional guest lodging units on private land in Tusayan through redevelopment •220,200 sq. ft. of additional retail including restaurants, gift shops, and a dinner theater •Development of orientation/ interpretive center adjacent to IMAX site, potentially with the National Geographic Society	•5,420 sq. ft. of retail including vending, limited food and beverage, and gift shops associated with transit center •Basic visitor orientation and information provided at transit center

Mitigation and Monitoring Measures

The following mitigation and monitoring measures generally apply to all of the **action alternatives** (Alternatives B through E), exceptions are noted under individual measures. Mitigation measures can involve reducing or avoiding the impact; repairing, restoring or rehabilitating the affected area; or, compensating for the impact. Monitoring can include the collection and analysis of data to assess the estimated impacts in the Environmental Impact Statement, and to consider for use in future planning. Measures are grouped by issue categories. The mitigation and monitoring measures will be more clearly defined in the Final Environmental Impact Statement, where they will focus on mitigating and monitoring the potential impacts of the preferred alternative, should an action alternative be identified or developed as the preferred alternative.

Surface Water and Groundwater

- The developer(s) will prepare, fund and implement a groundwater monitoring plan, in conjunction with the National Park Service, Arizona Department of Water Resources, U.S. Geological Survey, Havasupai Tribe and Navajo Tribe, to validate assumptions in the Environmental Impact Statement and to assess the impacts of well development on water discharge at springs in Grand Canyon. The monitoring plan will collect and assess water withdrawal data from existing wells in the Red Wall-Muav aquifer and collect water discharge data from Havasu, Indian Garden, Hermit and Blue Springs in Grand Canyon. The groundwater model used in the Environmental Impact Statement will be recalibrated based on information obtained from monitoring. Information gained from this monitoring plan will be maintained by the National Park Service and used for future groundwater systems planning. (This mitigation measure does not apply to Alternative E.)

- All development will comply with Sections 401, 402, and 404 of the Clean Water Act.

- Water pipelines and other utilities will use existing utility and transportation corridors to the extent practicable to reduce and minimize vegetation clearing and the disturbance of new ground.

Socioeconomic Resources

- The developer(s) will prepare, fund and implement a monitoring plan, in conjunction with the Forest Service, National Park Service, Coconino County, and Norther Arizona Council of Governments, to validate the socioeconomic impact analysis in the Environmental Impact Statement. The monitoring plan will consider the level of visitation at Grand Canyon National Park and performance in the lodging and retail markets in the outlying communities and in Tusayan. Information gained from this monitoring plan will be maintained by Coconino County and used for future planning. (This mitigation does not apply to Alternative E.)

- The developer(s) will prepare, fund and implement a comprehensive employment plan that addresses employment practices related to 1) encouraging the hiring of new employees from the northern Arizona employment base, including local American Indian Tribes, and 2) use of northern Arizona-based contractors.

Visitor Experience In and Around Grand Canyon

- The developer(s) will design, fund and implement a visitor survey, in conjunction with the National Park Service and Forest Service that will be conducted every three years through the year 2010 to examine visitor satisfaction at Grand Canyon National Park, Kaibab National Forest, and Tusayan.

- Developer(s) will provide visitor orientation information at the transit center and on the mass transit systems used at the transportation staging area.

Air Quality

- Water or other stabilizers will be applied to unpaved road sections and disturbed ground during construction to minimize dust.

- Primary transportation corridors into Grand Canyon National Park and developed areas will be hard-surfaced.

- Burning of slash and other debris created from construction will be prohibited. Vegetation debris created from construction activities will be chipped and used for mulch, or hauled off-site and disposed of in approved land-fills.

- All land areas disturbed by construction activities will be re-vegetated as quickly as possible to reduce the potential for blowing dust.

- Installation and use of wood-burning stoves in residential and visitor facilities developed on National Forest System lands will be prohibited.

Transportation

- The developer(s) will prepare a transportation impact analysis to determine needed roadway improvements for the internal traffic circulation, and for access off State Highway 64.

- The developer(s) will prepare a detailed transportation plan prior to conveyance of National Forest System land. The plan will consider all traffic circulation needs, including foot and bike paths within developed areas and routes linking developed areas with Grand Canyon National Park and attractions on National Forest System land.

Development Plan Assurances

- The transfer of National Forest System land into private ownership will be conditioned upon escrow instructions specifying that the conveyance will not be completed until the following are recorded in the Coconino County land records (This does not apply to Alternative E.):
    - development agreements containing covenants, conditions and restrictions or conservation easements ensuring that commitments in the Environmental Impact Statement are a binding condition of the land title and apply to all future landowners. Commitments include the construction phasing schedule and proposed uses of National Forest System land, e.g., housing, designated open space, school site, fire station, parks, etc.

    - development agreements containing covenants, conditions, and restrictions or conservation easements creating a mechanism to ensure that the proposed development will generate funding necessary to fulfill commitments in the Environmental Impact Statement in perpetuity.

Cultural Resources

- Cultural resource sites on National Forest System land will be mitigated through the design and implementation of a treatment plan for data recovery. The effectiveness of this mitigation will be ensured through compliance with Section 106 of the National Historic Preservation Act and consultation with the State Historic Preservation Office.

Threatened, Endangered, and Sensitive Species

- Mitigation for the Tusayan flameflower will include minimizing ground disturbance in plant population areas by incorporating these areas into green belts, buffer zones and natural areas; fencing of plant populations to prevent encroachment of equipment during construction activities; and active monitoring of plant populations during and following construction activities by a qualified botanist.

Special Land Uses

- Use and conveyance of National Forest System land will be subject to the continuation of existing easements and special use permits.

Fire Management Programs

- The developer(s) will design, fund and implement, in conjunction with the Forest Service and National Park Service, a fuel treatment program for wildland/urban interface areas.

Section 3: Affected Environment and Environmental Consequences

When comparing the proposed alternatives, it is important to understand the potential environmental consequences of implementing each of them.

Environmental consequences result from the level and type of development that is either proposed or may be expected from each alternative. The analysis and evaluation of the consequences provide the scientific and analytic basis for comparison of alternatives.

This section provides a summary of the anticipated environmental consequences associated with each alternative (Table 2). The summary is organized by resource issues, and addresses each issue that was identified through public scoping, as outlined in Section 1.

While most of the summary is self-explanatory, some background information is presented here to provide a frame of reference for those items which may require additional explanation. Portions of the surface and groundwater, socioeconomic, Grand Canyon visitor experience, and transportation issues will be described here. This background information will allow the reader to draw comparisons between the alternatives based on the existing condition of, and the potential environmental impacts to, the issues. This background information is derived from Chapters 3 and 4 of the draft Environmental Impact Statement, where a full discussion of the existing conditions related to all of the issues identified in this analysis can be found.

Surface and Groundwater

Water Supply

- Two privately owned water storage systems supply potable water to Tusayan. Water for these systems is supplied by two wells in Tusayan and purchased from Grand Canyon National Park and Williams, Arizona. Grand Canyon National Park obtains water from a gravity-fed pipeline from Roaring Springs on the north side of the Colorado River.

- Groundwater in the area comes from the Redwall-Muav aquifer. Two wells in Tusayan, one well at the Canyon Mine site near Tusayan (primarily used for groundwater quality monitoring), and two wells in the vicinity of Valle, Arizona, all pump from this aquifer. These wells combined have a capacity to pump an estimated 290 gallons per minute (gpm) from the aquifer.

Grand Canyon Water Resources

- The Redwall-Muav aquifer is divided into several sub-basins; two (the Havasu Springs and the Blue Springs sub-basin) are affected by this analysis.

- The Redwall-Muav aquifer is the only aquifer of regional extent and regional importance in the Tusayan area. Depth to groundwater level in the Redwall-Muav aquifer near Tusayan is about 2,500 feet below surface level.

- The groundwater flow system in the Redwall-Muav aquifer in the Tusayan area is believed to be in dynamic equilibrium (average rate of groundwater discharge at the springs is equal to average rate of recharge to the aquifer). Recharge to the Redwall-Muav aquifer around Tusayan is from absorption of precipitation and intermittent streamflow.

- The largest discharge from the aquifer in the Havasu Springs groundwater sub-basin, about 29,000 gpm, is at Havasu Springs. Measurements of discharge for Havasu Springs over a 70-year period indicate the rate of flow is remarkably constant. Smaller but important amounts of groundwater discharge occur along faults and related fracture systems at Hermit Springs and Indian Garden Springs; base rate of discharge at each of these springs is about 300 gpm. Blue Springs, in the Blue Springs groundwater sub-basin, discharges about 100,000 gpm.

Socioeconomic Environment

Grand Canyon/Tusayan Area

- The Grand Canyon/Tusayan area relies almost entirely on tourism for its economic base. Visitation data for Grand Canyon National Park show that more than 99% of visitors to the South Rim of Grand Canyon travel through the Tusayan area.

- The Grand Canyon/Tusayan area offers 1,964 lodging units.

- Hotels in the Grand Canyon/Tusayan area accommodate an estimated 29% of South Rim visitors.

- Based on a 1994/95 visitor survey, it appears that close to 35% of South Rim visitors would like to stay in the Grand Canyon/Tusayan area if lodging were available. However, due to insufficient available lodging units, many visitors are turned away and must find lodging in another community.

- Over the past five years, 485 rooms have been added to Tusayan, which represents a more than two-fold increase in the room supply in Tusayan.

- Tusayan provides lodging, food services, air tours and other visitor facilities.

- In the past seven years, the occupancy rate of lodging units in the Grand Canyon/Tusayan area has been in the mid-to-upper 70% level, substantially above other northern Arizona communities.

- Retail and food and beverage space in the Grand Canyon/Tusayan area totals about 182,000 square feet.

- Based on the socioeconomic model developed for this analysis, an estimated 1,835 new lodging units and approximately 190,000 square feet of retail and food service could be added through the year 2010 in the Grand Canyon/Tusayan area under moderate visitation growth projections for Grand Canyon National Park.

- Under any of the alternatives, new lodging units and retail additions could potentially exceed the level of development estimated to be needed in the Grand Canyon/Tusayan area according to the model developed for this analysis.

Outlying Communities

- There are approximately 13,000 hotel rooms in the northern Arizona lodging market. This analysis considers the northern Arizona region, including such communities as Flagstaff, Williams, Page, Sedona, Winslow, Holbrook, Fredonia, and Kingman. Although the analysis does not include every community in northern Arizona, it is representative of the northern Arizona lodging market.

- Many of the communities in northern Arizona depend to a large extent on tourist revenues created by visitation to Grand Canyon National Park. In general (with two notable exceptions--Las Vegas and Phoenix) the farther communities are from the park, the less they depend on these revenues.

- New lodging units were added every year over the past decade in the northern Arizona region, for a total of 4,772 new units since 1987.

- The new supply of rooms and associated room nights (one lodging unit creates 365 available room nights) has exceeded new demand in every year since 1990. This "excess" supply of new rooms has led to the decrease in occupancy rates, from 72% in 1990 to 63% in 1996 in the northern Arizona market.

- A performance analysis comparing the lodging industry in northern Arizona to U.S. norms revealed that properties in northern Arizona substantially outperformed U.S. average occupancies during the early 1990s. As a result of recent supply additions, the variance has moderated, with both averages in the mid-60% range.

- The northern Arizona region attracted 42% of visitors the night before entering and the night after leaving Grand Canyon National Park.

- The economic model developed for the draft Environmental Impact Statement estimated that through the year 2010, the northern Arizona area outside of Grand Canyon National Park and Tusayan could add 3,982 lodging units to support the increase in Grand Canyon visitor-related demand projected under the moderate visitation growth rate.

- Based on projected growth in visitation, most communities would still be able to build new lodging facilities even if a portion of demand is displaced to the Grand Canyon/Tusayan area.

- Displaced demand is demand that would be relocated from another area of northern Arizona to Grand Canyon/Tusayan if supply in Grand Canyon/Tusayan exceeds levels supportable by visitation growth (assuming occupancy and market penetration levels remain unchanged).

Visitor Experience In and Around Grand Canyon

Grand Canyon Experience

- The majority of the nearly five million tourists that visit Grand Canyon National Park each year enter the park at the South Rim. During the summer months average daily visitation is approximately 17,600.

- Visitation on the South Rim is primarily oriented toward use of private vehicles to access park facilities. People travel from one scenic area to another, ultimately ending up at Grand Canyon Village. During the summer season, roads are heavily congested, parking is inadequate, and the shuttle system is crowded.

- The visitor centers and interpretive facilities are too small for the number of visitors using them in the summer, and the exhibits are outdated and limited in their interpretation of the park's attributes.

- The combined result of conditions has been a gradual degradation of the visitor experience at Grand Canyon.

- To understand the Grand Canyon National Park visitor trip orientation, travel party characteristics, and satisfaction levels, a series of visitor surveys were conducted as part of this Environmental Impact Statement. Key findings of Grand Canyon visitor surveys were:
  - The percentage of first-time visitors at Grand Canyon is high
  - Grand Canyon National Park is often only a part of a more extensive travel itinerary
  - The duration of stay at Grand Canyon/Tusayan typically is short
  - One-third of visitors who attempted to make reservations at Grand Canyon National Park Lodges during the summer months were unsuccessful
  - One-third of visitors who attempted to make reservations in Tusayan during the summer months were also unsuccessful

- One-quarter to one-third of survey respondents who did not stay overnight expressed a desire to stay in Tusayan if hotels were available or were lower priced
- The geographic distribution of visitors the night before and the night after visiting Grand Canyon National Park is wide
- Visitors to Grand Canyon who stay in Phoenix or Las Vegas tend to stay longer in those cities than visitors who stay in Flagstaff or Williams
- Availability and cost of lodging units are the most important factors in a visitor's choice of where to stay in the Grand Canyon/Tusayan area
- Parking, hotels, and restaurants are the additional facilities most desired in the Grand Canyon/Tusayan area
- Survey respondents criticized the current pricing of hotels and restaurants
- Generally, visitors are satisfied with their overall experience at Grand Canyon National Park.

Light Pollution

- Grand Canyon National Park is a relatively remote area and is considered important for its solitude and wilderness values. Night views at Grand Canyon National Park are spectacular because of the lack of light-generating sources in the area.

- Sky glow was estimated in this analysis using "Walkers Law," a formula developed through the measurement of sky glow at different distances from numerous cities in California. This formula states that an increase in lighting of 20% above natural background light would affect the night-sky viewing with the naked eye. An increase of 10% above background would affect the viewing of stars with a powerful telescope (International Dark Sky Association, 1997).

Transportation

- The main mode of transportation into the South Rim of the park is by private vehicle through the south entrance. For the south entrance, 1996 data show that 71% of all visitors arrived by private vehicle, 16% by tour bus, 9% by airport shuttle bus, and 4% by train.

- The road system in Tusayan is quite limited. One main artery, State Highway 64, runs north and south through the Tusayan business district.

- The roads within Grand Canyon Village are very poor. Within the Village, visitors often park along the roadsides, creating traffic congestion.

- The General Management Plan encourages alternative modes of travel into the park to relieve traffic congestion.

- The "E" classification in the level of service concept denotes road conditions that either are approaching or are at maximum capacity. Many of the roads in Grand Canyon Village have a level-of-service classification of "E" during the summer months and are expected to exceed capacity as visitation increases if a mass transit system is not implemented.

The above information should provide a context for understanding these issues as presented in Table 2, the Environmental Consequences summary. This table describes the potential impacts of each alternative on the issues described in Section 1.

Table 2 Summary of Environmental Consequences

Resource Issue *sub-issue*	**Alternatives**				
	Alternative A: *No Action*	*Alternative B:* *Land Exchange Option 1*	*Alternative C:* *Land Exchange Option 2*	*Alternative D:* *Townsite Act/Special Use Permit*	*Alternative E:* *Transportation/Federal Housing*
Surface and Groundwater *Water Supply*	•Water needs will likely increase as visitation increases to GCNP and development seeks to accommodate visitor demand. Additional development is expected in Tusayan, on some of the private inholdings, on state trust land, on tribal land, and in outlying communities. •Total water demand could range between 88.5 million gallons per year (mgy) and 235 mgy (or more), depending on the level and type of development. •Per capita water consumption rates are unknown.	•147 mgy of water needed to supply development at full buildout. •Water supplied by five new wells drilled in Valle. •Water conservation techniques used, such as water harvesting, use of maximum water conserving appliances, use of reclaimed wastewater, and xeriscaping. •Water consumption equates to about 41.3 to 46.3 gallons per person per day.	•140 mgy of water needed to supply development at full buildout. •Water supplied by five new wells drilled in Valle. •Water conservation techniques used, such as use of reclaimed wastewater, and xeriscaping. •Water consumption equates to about 55.9 to 80 gallons per person per day.	•34.2 mgy of additional water needed to supply redevelopment at full buildout. •Water supplied from two existing wells in Tusayan and one new well drilled in Tusayan (47% or 41.6 mgy), water hauled from Williams (30% or 26.6 mgy), and water hauled from GCNP (23% or 20.3 mgy). •Water conservation techniques used, such as use of reclaimed wastewater, and xeriscaping. •Per capita water consumption rates are unknown.	•28.5 mgy of water needed to supply development at full buildout. •Water supplied/sold by GCNP (6.9 mgy), and reclaimed water supplied by Sanitary District (21.6 mgy). •Water conservation techniques used, such as use of reclaimed wastewater, and xeriscaping. •Water consumption equates to about 50 gallons of potable water and 35 gallons of nonpotable water per person per day for the residential area, and 0.25 gallons of potable and 2 gallons of nonpotable water per visitor per day for the transportation staging area.

Policy implications?

Resource Issue *sub-issue*	**Alternatives**				
	Alternative A: ***No Action***	*Alternative B:* ***Land Exchange Option 1***	*Alternative C:* ***Land Exchange Option 2***	*Alternative D:* ***Townsite Act/Special Use Permit***	*Alternative E:* ***Transportation/Federal Housing***
Surface and Groundwater *Grand Canyon Water Resources*	•Additional demands for groundwater in Havasu Springs sub-basin of Redwall-Muav aquifer from development in the region. •The two existing wells in Tusayan are expected to decrease the discharge of springs and seeps in Grand Canyon by about the amount of water pumped. •From the two existing wells in Tusayan, the rate of discharge from Grand Canyon springs would decrease by: Havasu 0.1% (29 gpm) Indian Garden 2.5% (7.5 gpm) Hermit 1.4% (4.2 gpm) •Additional groundwater pumped from the Havasu Springs groundwater sub-basin from new development, including the potential development of the private inholdings, would further decrease discharge from Grand Canyon springs. •A well drilled at Lower Basin would affect the Blue Springs groundwater sub-basin and most likely intercept water that would discharge from Blue Springs.	•Additional demands for groundwater in the Havasu Springs sub-basin from the CFV development. •From the CFV development, the rate of discharge from Grand Canyon springs would decrease by: Havasu 0.8% (232 gpm) Indian Garden 2.0% (6 gpm) Hermit 1.3% (3.9 gpm) •Reclaimed water may be reinjected into the aquifer, if allowed by Arizona Department of Environmental Quality (ADEQ), which would reduce impacts to Grand Canyon springs. •Collectively, from all potential development in area, the rate of discharge from Grand Canyon springs would decrease by a maximum of: Havasu 1.0% (278.4 gpm) Indian Garden 6.0% (18 gpm) Hermit 3.9% (11.7 gpm).	•Additional demands for groundwater in the Havasu Springs sub-basin from the CFV development. •From the CFV development, the rate of discharge from Grand Canyon springs would decrease by: Havasu 0.8% (232 gpm) Indian Garden 1.9% (5.7 gpm) Hermit 1.2% (3.6 gpm) •Reclaimed water may be reinjected into the aquifer, if allowed by ADEQ, which would reduce impacts to Grand Canyon springs. •Collectively, from all potential development in area, the rate of discharge from Grand Canyon springs would decrease by a maximum of: Havasu 1.0% (278.4 gpm) Indian Garden 5.9% (17.7 gpm) Hermit 3.8% (11.4 gpm).	•Additional demands for groundwater in the Havasu Springs sub-basin from redevelopment of Tusayan, and construction of housing, community facilities, and a transportation staging area. •From the redevelopment in Tusayan, the rate of discharge from Grand Canyon springs would decrease by: Havasu 0.2% (46.4 gpm) Indian Garden 4.0% (12 gpm) Hermit 2.6% (7.8 gpm) •Water needed from GCNP (Roaring Springs Pipeline) would total 20.3 mgy. Greater use of the overflow would reduce overflow spills into Garden and Pipe creeks, returning them to a more natural state. •Collectively, from all potential development in area, the rate of discharge from Grand Canyon springs would decrease by a maximum of: Havasu 1.0% (278.4 gpm) Indian Garden 6.0% (18 gpm) Hermit 3.9% (11.7 gpm). •A well drilled at Lower Basin would affect the Blue Springs groundwater sub-basin and most likely intercept water that would discharge from Blue Springs.	•No additional demands for groundwater in the Havasu Springs sub-basin would be required for this alternative. •Water needed from GCNP (Roaring Springs Pipeline) would total 6.9 mgy. Greater use of the overflow would reduce overflow spills into Garden and Pipe creeks, returning them to a more natural state. •Collectively, from all potential development in area, impacts on Grand Canyon springs would be similar to the direct and indirect impacts discussed under Alternative A. •A well drilled at Lower Basin would affect the Blue Springs groundwater sub-basin and most likely intercept water that would discharge from Blue Springs.

Resource Issue *sub-issue*	**Alternatives**				
	Alternative A: *No Action*	*Alternative B:* *Land Exchange Option 1*	*Alternative C:* *Land Exchange Option 2*	*Alternative D:* *Townsite Act/Special Use Permit*	*Alternative E:* *Transportation/Federal Housing*
Surface and Groundwater *Water Transportation*	•Existing water hauled from Williams and GCNP totals 28.8 mgy (1995 data). This requires approximately 4,800 round trip water truck loads per year. •Redevelopment in Tusayan may require more water to be hauled from outlying areas such as Williams and GCNP, thus increasing the number of tanker trucks on State Highway 64 and roads in the park. •Depending on the source of water used, development of the private inholdings may require water to be hauled from outlying areas, increasing the number of tanker trucks on State Highway 64 and potentially U.S. Highway 89 (if Lower Basin is developed).	•Water supplied by the Valle well field would be transported to the development by a pipeline in State Highway 64 right-of-way. •During emergencies, water supplied from Two Guns would be trucked to the development, increasing tanker truck traffic on State Highway 64.	•Same as Alternative B.	•Redevelopment in Tusayan, and construction of employee housing, community facilities, and a transportation staging area would require an estimated 18.13 mgy of additional water to be hauled. This would require an additional 3,021 hauling trips (1,311 from GCNP and 1,710 from Williams), requiring an additional five tanker trucks from Williams and four tanker trucks from GCNP per day on area highways. Water hauling would account for about 0.4% of the total traffic on State Highway 64. •Depending on the source of water used, development of the private inholdings may require water to be hauled from outlying areas, increasing the number of tanker trucks on State Highway 64 and potentially U.S. Highway 89 (if Lower Basin is developed).	•Water supplied by GCNP (6.9 mgy) for employee housing and the transportation staging area would be transported to the development by a pipeline in the transit system corridor. •Redevelopment in Tusayan may require more water to be hauled from outlying areas such as Williams and GCNP, thus increasing the number of tanker trucks currently on State Highway 64 and roads in the park. •Depending on the source of water used, development of the private inholdings may require water to be hauled from outlying areas, increasing the number of tanker trucks currently on State Highway 64 and potentially U.S. Highway 89 (if Lower Basin is developed).

Resource Issue *sub-issue*	**Alternatives**				
	Alternative A: No Action	*Alternative B: Land Exchange Option 1*	*Alternative C: Land Exchange Option 2*	*Alternative D: Townsite Act/Special Use Permit*	*Alternative E: Transportation/Federal Housing*
Socioeconomics *Tusayan/Grand Canyon area*	•Based on the moderate visitation growth scenario, a 30% penetration rate, and a 70% occupancy level, the economic model estimates that 1,835 lodging units and up to 190,000 sq. ft. of additional retail and food service could be added to the Grand Canyon/Tusayan area through the year 2010 with limited impacts on the existing businesses in the Grand Canyon/Tusayan area. Additional rooms or retail and food service added beyond what the model estimates as supportable may increase competition, which could reduce pricing, increase service, or could result in failure of less competitive or undercapitalized businesses. •The level of additions in any individual year would be influenced by the individual landowner, rather than a specified development schedule. •As proposed. up to 1,371 additional lodging units and 220,000 sq. ft. of retail and food service may be added to the Grand Canyon/ Tusayan area through independent redevelopment projects, subject to approval by Coconino County. •Development could also occur on state trust land. on tribal land, and in other communities, as well as on three of the private inholdings (Lower Basin, TenX, and Kotzin), which could provide some percentage of additional visitor services and facilities as proposed under Alternative B, subject to approval by Coconino County	•As proposed, up to 3,650 lodging units and 425,000 sq. ft. of retail and food service may be added to the Grand Canyon/ Tusayan area over a minimum 12-year period; this is 1,815 lodging units and 235,000 sq. ft. of retail and food service above what the model estimates as supportable through the year 2010. •The level of additions in any individual year would be influenced by a specified development schedule (Table 2.10). •Additional lodging units or retail added beyond what the model estimates as supportable may increase competition, which could reduce pricing, increase service, or result in failure of less competitive or undercapitalized businesses. •Redevelopment in the Grand Canyon/Tusayan area is expected to occur by the various entities and could add another 1,371 lodging units and 220,000 sq. ft. of retail and food service to the area, subject to approval by Coconino County, bringing the potential collective number of lodging units in the Grand Canyon/Tusayan area to 5,021, and the collective amount of retail and food service to 645,000 sq. ft.	•As proposed, up to 2,000 lodging units and 304,000 sq. ft. of retail and food service may be added to the Grand Canyon/ Tusayan area over a minimum 12-year period; this is 165 lodging units and 114,000 sq. ft. of retail and food service above what the model estimates as supportable through the year 2010. •The level of additions in any individual year would be influenced by a specified development schedule •Additional rooms or retail added beyond what the model estimates as supportable may increase competition, which could reduce pricing, increase service, or result in the failure of less competitive or undercapitalized businesses. •Redevelopment in the Grand Canyon/Tusayan area is expected to occur by the various entities and could add another 1,371 lodging units and 220,000 sq. ft. of retail and food service to the area, subject to approval by Coconino County, bringing the potential collective number of lodging units in the Grand Canyon/Tusayan area to 3,371. and the collective amount of retail and food service to 524,000 sq ft.	•As proposed, up to 710 lodging units and 220,000 sq. ft. of retail and food service may be added in Tusayan in the next five years. •The level of additions in any individual year would be influenced by the individual landowner, rather than a specified development schedule. •Additional rooms or retail added beyond what the model estimates as supportable may increase competition, which could reduce pricing, increase service, or result in the failure of less competitive and/or undercapitalized businesses. •Additional development in the Grand Canyon/Tusayan area, independent of the Tusayan redevelopment, could add another 661 lodging units and an undetermined amount of retail and food service to the area. •Development could also occur on state trust land, on tribal land, and in other communities, as well as on three of the private inholdings (Lower Basin, TenX, and Kotzin), which could provide some percentage of additional visitor services and facilities as proposed under Alternative B, subject to approval by Coconino County.	•No additional lodging units are proposed under this alternative. Limited retail and food service, about 5,400 sq. ft. would be built in association with the transportation staging area •Up to 1,371 additional lodging units and 220,000 sq. ft of retail and food service may be added to the Grand Canyon/Tusayan area by various entities through redevelopment projects. •Development could also occur on state trust land, on tribal land, and in other communities, as well as on three of the private inholdings (Lower Basin, TenX, and Kotzin), which could provide some percentage of additional visitor services and facilities as proposed under Alternative B, subject to approval by Coconino County. •Additional rooms or retail added beyond what the model estimates as supportable may increase competition, which could reduce pricing, increase service, or result in failure of less competitive or undercapitalized businesses.

Resource Issue *sub-issue*	**Alternatives**				
	Alternative A: *No Action*	*Alternative B:* *Land Exchange Option 1*	*Alternative C:* *Land Exchange Option 2*	*Alternative D:* *Townsite Act/Special Use Permit*	*Alternative E:* *Transportation/Federal Housing*
Socioeconomics *Other Outlying Communities*	•The economic model estimates that 3,982 rooms can be added to northern Arizona, outside of the Grand Canyon/Tusayan area, through the year 2010 to support Grand Canyon visitor-related demand and maintain existing supply-demand relationships. •As proposed, up to 1,371 additional lodging units may be added to the Grand Canyon/ Tusayan area by various entities through redevelopment projects, subject to approval by Coconino County. •Development could also occur on state trust land, on tribal land, and in other communities, as well as on three of the private inholdings (Lower Basin, TenX, and Kotzin), which could provide some percentage of additional visitor services and facilities as proposed under Alternative B, subject to approval by Coconino County. •Depending on the collective amount of development in the Grand Canyon/Tusayan area, northern Arizona communities could experience reduced potential of 297 to 1,447 lodging units through the year 2010. •Northern Arizona communities could still add between 2,535 and 3,685 new lodging units through the year 2010. •Depending on the collective amount of development in the Grand Canyon/Tusayan area, northern Arizona communities could experience a total reduced potential in visitor spending of $10.7 to $51.8 million through the year 2010. •Visitors are expected to generate total potential spending in northern Arizona communities between about $90.7 and $131.8 million by the year 2010.	•The CFV development and redevelopment project could result in the collective total of 5,021 additional lodging units in the Grand Canyon/Tusayan area by the year 2010. At this level of development, northern Arizona communities could experience reduced potential of 1,447 lodging units through the year 2010. Northern Arizona communities could still add 2,535 new lodging units through the year 2010. •Based on the collective amount of development in the Grand Canyon/Tusayan area, northern Arizona communities could experience a total reduced potential in visitor spending of $51.8 million through the year 2010. Visitors are expected to generate total potential spending in northern Arizona communities of about $90.7 million through the year 2010.	•The CFV development and redevelopment project could result in the collective total of 3,371 additional lodging units in the Grand Canyon/Tusayan area by the year 2010. At this level of development, northern Arizona communities could experience reduced potential of 754 lodging units through the year 2010. Northern Arizona communities could still add 3,228 new lodging units through the year 2010. •Based on the collective amount of development in the Grand Canyon/Tusayan area, northern Arizona communities could experience a total reduced potential in visitor spending of $26.9 million through the year 2010. Visitors are expected to generate total potential spending in northern Arizona communities of about $115.5 million through the year 2010.	•Same as Alternative A.	•Same as Alternative A

Resource Issue *sub-issue*	Alternatives				
	Alternative A: No Action	*Alternative B: Land Exchange Option 1*	*Alternative C: Land Exchange Option 2*	*Alternative D: Townsite Act/Special Use Permit*	*Alternative E: Transportation/Federal Housing*
Socioeconomics *Housing*	•No housing is proposed on NFS land, or using Federal funds on other land. •Housing for park employees could be provided by the private sector on the private inholdings or in the outlying communities of Valle, Williams, and Flagstaff. •As required by the Tusayan Area Plan, employers must provide housing for new employees generated by redevelopment of Tusayan, or potential development of the private inholdings.	•Housing includes 310 single-family, 1,045 apartment, and 1,220 dormitory units. •Housing is designated for: CFV (1,680 units), GCNP (400 units), Tusayan (495 units) employees •Housing cost: Single-family would sell for $60,000 to $110,000, apartments would rent for $640/month, and dormitories would rent for $455/month. •Canyon Forest Village Council formed to establish and enforce housing restrictions, rental rates, and determine resident eligibility to ensure housing is affordable and available.	•Housing includes 270 single-family, 945 apartment and 860 dormitory units. •Housing is designated for: CFV (1,075 units), GCNP (400 units), Tusayan (475 units). •Housing cost: Single-family would sell for $65,000, apartments would rent for $640/month, and dormitories would rent for $455/month. •Canyon Forest Village Council formed to establish and enforce housing restrictions, rental rates, and determine resident eligibility to ensure housing is affordable and available.	•Housing would be constructed on land acquired under the Townsite Act. •County Improvement District would sell land to Public Housing Authority to build housing. •Housing includes 270 single family, 424 mobile homes/ apartment, and 122 dormitory units. •Housing available to all area residents but earmarked for: GCNP (377 units), Tusayan (539 units). •Housing cost: Single-family would rent for $375/month, apartments would rent for $233/month, and dormitories would rent for $180/month . Subsidy structure for public housing has not been developed. •Public Housing authority formed to establish and enforce housing restrictions, rental rates, and resident eligibility to ensure housing is affordable and available.	•Housing would be constructed on NFS land through execution of a Memorandum of Understanding between the USDA and USDI. •Housing includes 20 duplex, 38 apartment, and 42 dormitory units. •Housing would be available for Federal employees only. •No private sector housing proposed on NFS land. •Rental rates for Federal housing complex would be established using a government formula if construction is funded by the Federal government; rental rates would be based on market conditions if construction is funded by a private developer.
Socioeconomics *Employment Opportunities*	•Employment opportunities are expected to be generated through redevelopment in the Grand Canyon/Tusayan area and potential development of the private inholdings.	•This alternative would be expected to generate 3,334 new jobs ranging from laborers, construction managers and chefs, to retail and hotel managers. •Some additional jobs may be created in outlying communities to serve the CFV development.	•This alternative would be expected to generate 2,115 new jobs ranging from laborers, construction managers and chefs, to retail and hotel managers. •Some additional jobs may be created in outlying communities to serve the CFV development.	•This alternative would be expected to generate 1,078 new jobs ranging from laborers, construction managers and chefs, to retail and hotel managers. •A number of secondary jobs would be created in Tusayan to service the new development and employment base, in addition to a small number of jobs in the outlying communities.	•This alternative would be expected to generate 28 new jobs ranging from laborers, construction managers and maintenance workers, to administrative and transit managers. •Few, if any, secondary jobs would be generated.

Resource Issue *sub-issue*	**Alternatives**				
	Alternative A:* *No Action	***Alternative B:* *Land Exchange Option 1***	***Alternative C:* *Land Exchange Option 2***	***Alternative D:* *Townsite Act/Special Use Permit***	***Alternative E:* *Transportation/Federal Housing***
Socioeconomics *Crime Rates*	•Existing law enforcement services would continue. Coconino County would provide 3 deputies, National Park Service (NPS) would patrol the park, and KNF would patrol NFS land. •Continued development in the area could hinder available law enforcement from development scattered in several areas.	•A county sheriff's substation would be built and equipped by CFV. •Opportunities for criminal activity would increase because of increased development and population growth in the area. •Law enforcement responsibilities for the county, NPS, and KNF would remain unchanged.	•Same as Alternative B.	•As proposed, office space would be available in the community center for a sheriff's office. •Opportunities for criminal activity would increase because of increased development and population growth in the area. •Law enforcement responsibilities for the county, NPS, and KNF would remain unchanged.	•Same as Alternative A.

Resource Issue *sub-issue*	**Alternatives**				
	Alternative A: ***No Action***	***Alternative B:*** ***Land Exchange Option 1***	***Alternative C:*** ***Land Exchange Option 2***	***Alternative D:*** ***Townsite Act/Special Use Permit***	***Alternative E:*** ***Transportation/Federal Housing***
Socioeconomics *Community Infrastructure*	•The Tusayan fire district is planning to build a temporary fire station to serve the community of Tusayan. •No additional community infrastructure is proposed. •Any community infrastructure that is built would be at the land owner's discretion or as may be required through zoning with Coconino County. •Tax revenue for Federal, state, and county governments would increase with new development and employment in the area.	•The developer would make land available and build, at their expense, parks, police/sheriff station, fire station, community center, library, and post office. •An improved school site would be donated to the School District along with a $1 million grant to help build a new school. •Land would be available for houses of worship. •Office space would be available to a primary health care provider. •Approximately 322,000 gallons of sewage would be generated per day. Sewage would be treated using Solar Aquatic System. Reclaimed water would be used for landscape irrigation, toilet flushing, discharged to natural or man-made ponds, or reinjected into the aquifer. •Solid waste would be hauled to the Flagstaff landfill, which would shorten the lifespan of this landfill somewhat. •Development would generate a substantial amount of tax revenue for Federal, state, and county government.	•The developer would make land available and build, at their expense, parks, police/sheriff station, fire station, community center, library, and post office. •An improved school site would be donated to the School District. •Land would be available for a non-denominational house of worship. •Office space would be available to a primary health care provider. •Approximately 309,000 gallons of sewage would be generated per day. Sewage would be treated using a conventional wastewater treatment plant. Reclaimed water would be used for landscape irrigation, toilet flushing, discharged to natural or man-made ponds, or reinjected into the aquifer. •Solid waste would be hauled to the Flagstaff landfill, which would shorten the lifespan of this landfill somewhat. •Development would generate a substantial amount of tax revenue for Federal, state, and county government.	•County Improvement District would make land available for purchase by governmental entities to build community services and facilities. •Governmental entities would raise funds to build facilities. •Proposed facilities include school site, fire station, and community center. •Community center to house medical center, sheriff's office, chamber of commerce, American Legion and other service organizations, etc. •The existing medical facility in the park would continue to provide emergency care in the area. During the summer months, it operates near capacity. Office space may be made available in the community center for a health care provider. •Approximately 70,000 gallons of sewage would be generated per day. Sewage would be treated by the existing facility operated by the South Grand Canyon Sanitary District. Reclaimed water would then be used for landscape irrigation and toilet flushing. •Solid waste would be hauled to the County transfer station, then to the Flagstaff landfill which would shorten the lifespan of the landfill somewhat. The county would have to haul trash from the transfer station more frequently. •Development would generate a substantial amount of tax revenue for Federal, state, and county government.	•Similar to Alternative A.

Resource Issue *sub-issue*	**Alternatives**				
	Alternative A: *No Action*	*Alternative B:* *Land Exchange Option 1*	*Alternative C:* *Land Exchange Option 2*	*Alternative D:* *Townsite Act/Special Use Permit*	*Alternative E:* *Transportation/Federal Housing*
Visitor Experience *Grand Canyon Experience*	•Additional visitor facilities potentially built in several locations spread throughout the region, such as Tusayan, Valle, private inholdings, and other communities. Redevelopment in Tusayan and potential development of private inholdings would satisfy to some degree the unmet demand for lodging near the park. •Development in several areas in the region would disperse visitation. •If Grand Canyon Railway spurline is built, it would function as one of several different modes of transportation that could potentially be implemented to reduce traffic congestion in the park. •Visitors would continue to rely heavily on their private vehicles to access the park resulting in increased traffic and parking congestion, and negatively affecting visitor experience. •Development of Lower Basin inholding would change visitor patterns, increasing use of facilities at Desert View, and increasing traffic on East Rim Drive. •NPS would place restrictions on visitation.	•Visitors would park their cars at the transportation staging area north of Tusayan and proceed to a center where they would purchase parking/transportation/park entry tickets, obtain orientation information, and proceed to the park. Visitors would have access to a substantial amount of facilities around the transportation staging area within walking distance. •INSIGHT, the proposed educational facility, developed in partnership with the Museum of Northern Arizona, would offer visitors an opportunity to learn about the natural and cultural resources of the area. Development would be concentrated in one area around the existing community of Tusayan. •Average length of visitor stay to area may increase. •Visitors may travel to and from the park using mass transit more than once per day. Hiking/biking trails would also be available for access to the park. •A substantial amount of new lodging would satisfy the demand for lodging near the park.	•Similar to Alternative B, except that fewer lodging, retail, and food service choices would be available to visitors, and the development would be of a slightly lower quality, which may have an unquantifiable effect on the visitors experience.	•Visitors would park their cars at the transportation staging area north of Tusayan and proceed to a center where they would purchase parking/transportation/park entry tickets, obtain orientation information, and proceed to the park. •Redevelopment of the commercial property in Tusayan would offer visitor facilities to the south of the transportation staging area, but for some visitors these facilities may be too distant for walking. Because visitor facilities would not be directly adjacent to the staging area, the visitor would experience or perceive less commercial development. •A new orientation/interpretive center would be built adjacent to IMAX. This new facility would be potentially developed in conjunction with the National Geographic Society and would offer educational and interpretive information. •The amount of new lodging would partially satisfy the demand for lodging near the park. •Average length of visitor stay to area may increase. •Development of Lower Basin could change visitor patterns, increasing use of facilities at Desert View, and increasing traffic on East Rim Drive.	•Essentially the same as described under Alternative D. This alternative would entail the construction and operation of a transportation staging area, where little commercial development would take place. A small amount of retail and food service would be associated with the transportation staging area. •Development in several areas in the region would disperse visitation. •Average length of visitor stay to area may increase. •Development of Lower Basin could change visitor patterns, increasing use of facilities at Desert View, and increasing traffic on East Rim Drive.

Resource Issue *sub-issue*	**Alternatives**				
	Alternative A: No Action	*Alternative B: Land Exchange Option 1*	*Alternative C: Land Exchange Option 2*	*Alternative D: Townsite Act/Special Use Permit*	*Alternative E: Transportation/Federal Housing*
Visitor Experience *Visual Quality*	•The NFS land involved in this analysis would not be developed, but redevelopment of Tusayan or development of the private inholdings would alter the visual character of adjacent NFS land. •Private inholdings would remain in private ownership and available for potential development. Development could be dispersed in the region over several areas. •The development of the TenX inholding (194 acres) would negatively affect visual quality of the landscape viewed from Forest Road 302. •The development of the Lower Basin inholding (320 acres) would negatively affect visual quality of the landscape from State Highway 64.	•Approximately 672 acres of NFS land adjacent to Tusayan would be developed. The private inholdings would be acquired by KNF through a land exchange and precluded from future development. •The project would use the concepts of sustainable design which include architectural styles and construction materials that minimize impacts to landform, vegetation, and other natural systems. •Dedicated open space accounts for 17% of the total acreage allocated to this alternative, and additional open areas, trails, and natural landscaping are integrated into all areas of the development to make it appear less urban. •The conversion of land from undeveloped to community development would result in extending the existing viewed development of Tusayan to Moqui Lodge. Measures to buffer the development and highway setbacks would be used to maintain the visual integrity of State Highway 64 corridor.	•Approximately 380 acres of NFS land adjacent to Tusayan would be developed. The private inholdings would be acquired by KNF through a land exchange and precluded from future development. •The development would use design guidelines that place more emphasis on the functional use of the land and less on aesthetic values. The development would appear more urban with limitations on the ability to preserve the natural terrain and vegetation of the site. •Dedicated open space accounts for 3% of the total acreage allocated to this alternative. •The conversion of land from undeveloped to community development would result in extending the existing viewed development of Tusayan to Moqui Lodge. Measures to buffer the development and highway setbacks would be used to maintain the visual integrity of State Highway 64 corridor.	•Approximately 116 acres of NFS land would be developed adjacent to Tusayan for community needs and a transportation staging area, and portions of private land in Tusayan would be redeveloped to provide additional visitor facilities. •Design guidelines to address visual concerns would be based on provisions in the Tusayan Area Plan. Additional measures to minimize visual quality impacts could be implemented on the NFS land used for employee housing, community services, and the transportation staging area. •The existing visual character of Tusayan would not likely be diminished. Grand Canyon Improvement Association (GCIA) is working with ADOT to landscape State Highway 64 corridor as it passes through Tusayan to improve visual quality along the highway. •Little difference would be noticed between this alternative and Alternatives B and C as viewed from State Highway 64. •Potential development of the private inholdings, particularly TenX and Lower Basin, would alter the visual character of adjacent NFS land, and would negatively affect visual quality of the landscape viewed from Forest Road 302 and State Highway 64.	•Approximately 120 acres of NFS land would be developed. The project would employ the concept of sustainable design, similar to that explained under Alternative B, to minimize impacts to the visual resource. •The existing visual character of Tusayan would not likely be diminished. •The transportation staging area would likely be the only development noticeable from the highway. This would extend the existing urban views of Tusayan by less than ¼ mile, undeveloped NFS land would then be viewed for about two-thirds mile, until passing Moqui Lodge. Measures to buffer the development and highway setbacks would be used to maintain the visual integrity of State Highway 64 corridor. •Potential development of the private inholdings, particularly TenX and Lower Basin, would alter the visual character of adjacent NFS land, and would negatively affect visual quality of the landscape viewed from Forest Road 302 and State Highway 64.

Resource Issue *sub-issue*	**Alternatives**				
	Alternative A: No Action	*Alternative B: Land Exchange Option 1*	*Alternative C: Land Exchange Option 2*	*Alternative D: Townsite Act/Special Use Permit*	*Alternative E: Transportation/Federal Housing*
Visitor Experience *Air Quality*	•Any development that occurs would be required to comply with the standards of a Class I airshed in addition to National Ambient Air Quality Standards established by the Environmental Protection Agency (EPA). •Short-term construction related impacts would be expected from new development, such as dust and vehicle exhaust. •Impacts could result from installing wood burning stoves in residences and continued reliance on private vehicles by residents and visitors.	•Any development that occurs would be required to comply with the standards of a Class I airshed in addition to National Ambient Air Quality Standards established by the EPA. •Short-term construction related impacts would be expected from new development, such as dust and vehicle exhaust. •Although visitation to the park should increase substantially, current air quality conditions in the park should not deteriorate because of measures taken to limit use of private vehicles in the park and development of a transportation staging area and mass transit system. •Vehicle emissions at the transportation staging area would increase. These impacts would be localized and of short duration. •If secondary transportation staging areas are developed in outlying communities, as proposed in the Regional Transportation Plan, they would further reduce reliance on private vehicles to reach GCNP and thus reduce vehicle emissions on a regional basis.	•Same as Alternative B.	•Any development that occurs would be required to comply with the standards of a Class I airshed in addition to National Ambient Air Quality Standards established by the EPA. •Federal agencies involved in the project require air quality mitigation measures similar to those already in place in the park for development of housing, community facilities, and development of the transportation staging area. •Short-term construction related impacts would be expected from new development, such as dust and vehicle exhaust. •Although visitation to the park should increase substantially, current air quality conditions in the park should not deteriorate because of measures taken to limit use of private vehicles in the park and development of a transportation staging area and mass transit system. •Vehicle emissions at the transportation staging area would increase. These impacts would be localized and of short duration. •If secondary transportation staging areas are developed in outlying communities as proposed in the Regional Transportation Plan, they would further reduce reliance on private vehicles to reach GCNP and thus reduce vehicle emissions on a regional basis. •Impacts could result from installing wood burning stoves in residences constructed on private land in the area, including the private inholdings.	•Same as Alternative D, except that no community facilities are planned to be built.

Resource Issue *sub-issue*	**Alternatives**				
	Alternative A: ***No Action***	***Alternative B:*** ***Land Exchange Option 1***	***Alternative C:*** ***Land Exchange Option 2***	***Alternative D:*** ***Townsite Act/Special Use Permit***	***Alternative E:*** ***Transportation/Federal Housing***
Visitor Experience *Light Pollution*	•Redevelopment near Tusayan plus development of the private inholdings would disperse light pollution over a broad area, increasing the impact to GCNP viewpoints over a greater area. •Development near Tusayan and at Lower Basin, could increase background ambient night-sky levels by up to 25% at Mather Point, and by up to 4% at Desert View.	•Development would be concentrated in one area around Tusayan, which would concentrate light pollution in one area. •Outdoor lighting would only be installed as is necessary to meet provisions of Zone III of the Coconino County Lighting Code. •Ambient night-sky levels at the North Rim would increase 3.0% over existing conditions. •Impacts of greater than 20% would be noticeable with a naked eye up to 7.6 miles from the CFV development, including Mather Point which would observe a 37% increase over existing night-sky glow levels. •Collectively, development in the Tusayan area could increase background ambient night-sky levels by more than 20% up to 13.3 miles from Tusayan, including most overlooks on the South Rim.	•Development would be concentrated in one area around Tusayan, which would concentrate light pollution in one area. •Outdoor lighting would only be installed as is necessary to meet provisions of Zone III of the Coconino County Lighting Code. •Ambient night-sky levels at the North Rim would increase 1.6% over existing conditions. •Impacts of greater than 20% would be noticeable with a naked eye up to 6.0 miles from the CFV development. •Collectively, development in the Tusayan area could increase background ambient night-sky levels by more than 20% up to 10.7 miles from Tusayan, including several overlooks on the South Rim.	•Outdoor lighting would be installed to comply with Zone I of the Coconino County Lighting Code. •Ambient night-sky levels at the North Rim. would increase 0.6% over existing conditions. •Impacts of greater than 20% would be noticeable with a naked eye up to 3.9 miles from the Tusayan area. •Redevelopment in Tusayan, plus development of the private inholdings would disperse light pollution over a broad area, increasing the impact to GCNP viewpoints over a greater area. •Impacts from potential collective development in the Grand Canyon/Tusayan area could be the same as those described in Alternative A.	•Ambient night sky light levels would not noticeably increase at GCNP overlooks. •Redevelopment in Tusayan, plus development of the private inholdings would disperse light pollution over a broad area, increasing the impact to GCNP viewpoints over a greater area. •Impacts from potential collective development in the Grand Canyon/Tusayan area could be the same as those described in Alternative A.

Resource Issue *sub-issue*	**Alternatives**				
	Alternative A: No Action	*Alternative B: Land Exchange Option 1*	*Alternative C: Land Exchange Option 2*	*Alternative D: Townsite Act/Special Use Permit*	*Alternative E: Transportation/Federal Housing*
Visitor Experience *Noise*	•Approximately 42 acres of existing private land in Tusayan would receive noise from the airport above 65 decibels (dBa) by the year 2010 (planning horizon for implementation of the Grand Canyon Airport Master Plan). Redevelopment is not currently proposed for this 42 acre area. •If constructed, the Grand Canyon Railway spurline would alleviate some private vehicle noise in the park, but with increased visitation and continued reliance on the use of private vehicles, this reduction would be quickly absorbed. Operation of the trains may increase noise in the Tusayan area during their approach into and out of depot, and to residents living along the train corridor between Grand Canyon Airport and Maswik. •Use of private vehicles would continue and would affect visitors who seek solitude in the park.	•The development would fall outside the 65 dBa contour for airport noise levels. •Noise levels in the park would be reduced from restricting use of private vehicles and developing a mass transit system. •Short-term impacts from construction activities associated with development would be expected in the Tusayan area. These would continue through the 12-year buildout. •Planned development in Tusayan could accelerate the addition of a third runway at Grand Canyon Airport, increasing air traffic and related aircraft noise in Tusayan.	•Same as Alternative B.	•Similar to Alternatives B and C, except that development could occur on the Lower Basin inholding resulting in increased use of private vehicles in the eastern portion of the park, increasing vehicle noise. •Other portions of the South Rim would be closed to private vehicle use, reducing noise levels in these areas. •Collective development in the Grand Canyon/Tusayan area may accelerate the addition of a third runway at Grand Canyon Airport, increasing air traffic and related aircraft noise in Tusayan.	•Similar to Alternative D.

Resource Issue *sub-issue*	**Alternatives**				
	Alternative A:* *No Action	***Alternative B:* *Land Exchange Option 1***	***Alternative C:* *Land Exchange Option 2***	***Alternative D:* *Townsite Act/Special Use Permit***	***Alternative E:* *Transportation/Federal Housing***
Visitor Experience *GCNP Management*	•Additional lodging units are provided by redevelopment in Tusayan, and potential development of the private inholdings, and other developable land in the region. •If built, Grand Canyon Railway spurline could handle up to 1 million visitors per year. By the year 2010, this would leave 6.8 million visitors still unable to access mass transit, having to use private vehicles or tour buses to visit the park. The NPS would have to institute some limited visitation restrictions. •No plans or assurances that adequate and affordable housing would be built for NPS or park concessionaire employees. •Development of community facilities would be at landowner's discretion.	•3,650 additional lodging units are provided by CFV development, satisfying the demand for lodging near the park, but outside park boundaries. •Construction of 100- acre INSIGHT facility (an educational/experiential center developed in partnership with the Museum of Northern Arizona). Visitors would pay to use this facility. •Transportation staging area is built north of Tusayan with parking capacity of 8,000 to 10,000 vehicles with ability to expand. •175 single-family, 105 apartment units, and 120 dormitory units are proposed to be built and available for NPS and park concessionaire employees. Housing would be subsidized through recapture fees and assessments to commercial property owners to keep housing rates affordable for local employees. •A full mix of community facilities would be provided.	•Similar to Alternative B, except that 2,000 additional lodging units are provided, INSIGHT would be built on 25 acres, only manufactured, single-family homes would be built, and community infrastructure would be available in a slightly different manner (See Community Infrastructure above)	•710 additional lodging units are provided by redevelopment in Tusayan, partially satisfying the demand for lodging near the park, but outside park boundaries. •IMAX theater would be redesigned and an orientation center would be constructed by Destination Cinema and National Geographic (pending agreements) adjacent to IMAX. Visitors would pay to use this facility. •Transportation staging area would be built adjacent to IMAX theater with parking capacity of 4,500 vehicles. •916 units in a mixture of single-family, mobile home/apartment, and dormitory units are available for residents of the area including NPS and park concessionaire. Employee housing cannot be designated to a particular employer. Subsidy structure for public housing authority has not been developed, but proposed rental rates imply a subsidy of some sort. •A mix of community facilities would be provided.	•Additional lodging units are provided by redevelopment in Tusayan, and potential development of the private inholdings, and other developable land in the region. •Transportation staging area is built directly north of Tusayan with parking capacity of 4,500 vehicles. •100 housing units in mix of duplex, apartment, and dormitory units is proposed for Federal employees. Housing would be built on NFS land under a Memorandum of Agreement between the USDA and USDI. •Development of community facilities would be at landowner's discretion.

Resource Issue *sub-issue*	**Alternatives**				
	Alternative A: ***No Action***	***Alternative B:*** ***Land Exchange Option 1***	***Alternative C:*** ***Land Exchange Option 2***	***Alternative D:*** ***Townsite Act/Special Use Permit***	***Alternative E:*** ***Transportation/Federal Housing***
Visitor Experience *GCNP Visitation*	•Redevelopment in Tusayan, and development of the private inholdings, other private land in the area, and other communities would relieve some of the pressures on GCNP to provide visitor facilities inside the park. While these visitors may choose to stay longer in the Grand Canyon/Tusayan area, they would not be expected to lengthen their stay in the park, or make multiple trips to the park. •If built, Grand Canyon Railway spurline could handle up to 1 million visitors per year, but the majority of visitors would continue to access the park in private vehicles. •The NPS would institute limited restrictions on park visitation.	•Development under this alternative would provide a full range of visitor services and facilities for the increasing number of people expected to visit the park. The length of visitor stay in the area would likely increase. •A transportation staging area is proposed that could accommodate even the most aggressive visitation projections. Visitors may be more likely to make multiple trips into the park, depending on the frequency, ease of use, and cost of the mass transit system. Visitors may be more evenly distributed throughout the day, relieving pressures on facilities and management in the park. •With the large portion of visitor services and educational amenities located outside the park, visitors would be less likely to overuse the services inside the park.	•Same as Alternative B, although Alternative C proposes a smaller development.	•Development under this alternative would provide a full range of visitor services and facilities for the increasing number of people expected to visit the park. The length of visitor stay in the area would likely increase. •A transportation staging area is proposed that could accommodate most visitation projections. Visitors may be more likely to make multiple trips into the park, depending on the frequency, ease of use, and cost of the mass transit system. Visitors may be more evenly distributed throughout the day, relieving pressures on facilities and management in the park. •With the large portion of visitor services and educational amenities located outside the park, visitors would be less likely to overuse the services inside the park.	•Redevelopment in Tusayan, and development of the private inholdings, other private land in the area, and other communities would relieve some of the pressures on GCNP to provide visitor facilities inside the park. While these visitors may choose to stay in the area longer, they would not be expected to lengthen their stay in the park. Some visitors may make multiple trips to the park depending on the frequency and cost of the mass transit system. •The transportation staging area proposed could accommodate most visitation projections.

Resource Issue *sub-issue*	**Alternatives**				
	Alternative A:* *No Action	***Alternative B:* *Land Exchange Option 1***	***Alternative C:* *Land Exchange Option 2***	***Alternative D:* *Townsite Act/Special Use Permit***	***Alternative E:* *Transportation/Federal Housing***
Transportation	•No designated transportation staging area would be built outside of Tusayan; however, the Grand Canyon Railway spurline, if constructed, could accommodate up to 1 million visitors per year (about 14% of the expected visitation to the South Rim by the year 2010). •During the summer months the Grand Canyon Village roads would operate at a level-of-service classification of "E" or possibly "F" (poorest rating). As visitation increases, longer lines would be expected at the South Entrance. The existing shuttle system would become increasingly delayed in congested traffic. Parking areas and vista points along the South Rim would be unable to handle the large numbers of private vehicles. Measures would need to be implemented by the NPS to restrict visitation. •To maintain the level-of-service classification of State Highway 64, Coconino County or Arizona Department of Transportation (ADOT) may require improvement to the highway as part of the project planning for development proposals in Tusayan, and potentially, the private inholdings. •If secondary transportation staging areas are developed in outlying communities as proposed in the Regional Transportation Plan, they would further reduce reliance on private vehicles to reach GCNP and thus decrease vehicle emissions on a regional basis. •If Lower Basin is developed, increased traffic would be expected on U.S. Highway 89 and State Highway 64 between Desert View and Tusayan.	•Transportation staging area would be built directly north of Tusayan. •By restricting use of private vehicles in the park, Grand Canyon Village roads would operate at a level-of-service classification of "B" or possibly "A" (highest rating). Park shuttles would experience minimal delays and should run on dependable and regular schedules. •Improvements to State Highway 64 are proposed, including an enhanced intersection that may have a traffic signal at some point. Highest use of the intersection would occur most likely in the morning (10 am - 2 pm) and late afternoon (4-6 pm). During these hours, the level of service on State Highway 64 may deteriorate. •If secondary transportation staging areas are developed in outlying communities as proposed in the Regional Transportation Plan, they would further reduce reliance on private vehicles to reach GCNP and thus decrease vehicle emissions on a regional basis.	•Same as Alternative B.	•Transportation staging area built adjacent to IMAX theater. •By restricting use of private vehicles in the park, Grand Canyon Village roads would operate at a level-of-service classification of "B" or possibly "A" (highest rating). Park shuttles would experience minimal delays and should run on dependable and regular schedules. •Improvements to State Highway 64 are proposed, including installing two left-turn lanes at the two intersections that access the transportation staging area. All other intersections would have a single left-turn lane. Highest use of the intersection would occur most likely in the morning (10 am - 2 pm) and late afternoon (4-6 pm). During these hours, the level of service on State Highway 64 may deteriorate. •Development of Lower Basin may attract more people to the East Entrance. These visitors would access the park with their private vehicles. The vista points and parking areas in the eastern portion of the park may become overused. Traffic on State Highway 64 between Desert View and Tusayan would increase. Tourists staying at Lower Basin would drive from Desert View to the transportation staging area in Tusayan and use the mass transit system to visit Grand Canyon Village. •If secondary transportation staging areas are developed in outlying communities as proposed in the Regional Transportation Plan, they would further reduce reliance on private vehicles to reach GCNP and thus decrease vehicle emissions on a regional basis.	•Transportation staging area built directly north of Tusayan. •By restricting use of private vehicles in the park, Grand Canyon Village roads would operate at a level-of-service classification of "B" or possibly "A" (highest rating). Park shuttles would experience minimal delays and should run on dependable and regular schedules. •Improvements to State Highway 64 are proposed, including constructing an underpass at the State Highway 64 crossing of Long Jim Canyon to accommodate access lanes to and from the transportation staging area. This is the most efficient means of routing vehicles off the highway, and minimal changes in traffic flow on the highway should occur. •Development of Lower Basin may attract more people to the East Entrance. These visitors would access the park with their private vehicles. The vista points and parking areas in the eastern portion of the park may become overused. Traffic on State Highway 64 between Desert View and Tusayan would increase. Tourists staying at Lower Basin would drive from Desert View to the transportation staging area in Tusayan and use the mass transit system to visit Grand Canyon Village. •Secondary transportation staging areas, if developed in outlying communities, would further reduce reliance on private vehicles to reach GCNP and thus decrease vehicle emissions on a regional basis.

Resource Issue *sub-issue*	**Alternatives**				
	Alternative A: No Action	*Alternative B: Land Exchange Option 1*	*Alternative C: Land Exchange Option 2*	*Alternative D: Townsite Act/Special Use Permit*	*Alternative E: Transportation/Federal Housing*
Development Plan Assurances	•Development in Tusayan and on the private inholdings would continue to follow market forces at the discretion of the landowner and local land use and development policies. •Coconino County would be responsible for ensuring compliance with the Tusayan Area Plan. The primary criteria for evaluating projects would be the zoning code.	•A comprehensive and enforceable package of mechanisms and long-term financing provisions are proposed that provide assurances that the commitments related to housing, informational and educational facilities, community services and facilities, transportation staging area, conservation, open space, sustainable design, and phasing of the development would be implemented during the life of the project. •These commitments would be structured so they would not be subject to reconsideration through the local zoning process. •Deed restrictions would run with title to the property, binding these commitments to future landowners. •Commitments would be further ensured through the creation of Canyon Forest Village Council and Environmental Preservation Trust Entity. The Canyon Forest Village Council would have representatives from local and Federal agencies and environmental organizations on the board of directors.	•Same as Alternative B.	•Activities occurring on NFS land acquired through the Townsite Act would be subject to statutory requirements limiting the use of these lands to community and noncommercial purposes. •The County Improvement District, when formed, would purchase the NFS land under the Townsite Act, and would be responsible for monitoring and enforcing the provisions of the Townsite Act. •The County Improvement District would make land available for other governmental entities (Public Housing Authority, School District, Fire District) to purchase land for use to build public housing and communities services and facilities. •No mechanism exists to ensure that the community facilities would be developed according to the proposed manner and schedule. •The transportation staging area would be constructed and operated under a special use permit and subject to the monitoring and enforcement mechanisms incorporated into the USFS special use permit.	•The transportation staging area would be constructed and operated under a special use permit and subject to the monitoring and enforcement mechanisms incorporated into the Forest Service special use permit. •Federal housing would be constructed on NFS land under a Memorandum of Agreement between the USDA and USDI. Commitments related to the development of housing would be assured through the terms and conditions of this Agreement or other agreements between the KNF and GCNP.

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Cultural Resources	•No immediate impact to the four archaeological sites on the NFS land involved in this analysis would occur. These four sites are eligible for nomination to the National Register of Historic Places. •Future development of the private inholdings could result in disturbance or destruction of archaeological sites on those lands. The three private inholdings with the greatest development potential contain 20 sites (TenX = 4 sites, Lower Basin = 16 sites, Kotzin = no sites). •Traditional Cultural Properties (TCPs) initially identified to date on the Ten X, Lower Basin, and Kotzin inholdings include 8 Hopi and Zuni sites (with Puebloan or Puebloan/Cohonina affiliation), and two Navajo sites (with three sweat lodges). •The nine remaining inholdings contain 82 sites, 47 of which have been initially identified as TCPs. Although these inholdings are more remote and less likely to be developed, these cultural resources would be afforded little protection under private ownership and management.	•Three of the four eligible sites would be located on the INSIGHT campus and could be protected from disturbance. •The fourth eligible site would be located near the transportation staging and parking area, and could not be avoided. •Sites susceptible to disturbance would require a data recovery plan, developed in consultation with KNF, State Historic Preservation Office (SHPO), Advisory Council on Historic Places (ACHP), and the tribes to ensure that data and information contained in the site is retrieved. •The KNF would acquire 102 archaeological sites on 12 private inholdings, 57 of which have been initially identified as TCPs. These sites would be afforded greater protection under Federal ownership and management	•Three of the four eligible sites would be located on proposed lodging facilities. These sites could not be avoided. •The fourth site would be located near the proposed village core, and also could not be avoided. •All four sites would require a data recovery plan, developed in consultation with KNF, SHPO, ACHP, and the tribes to ensure that data and information contained in the site is retrieved. •The KNF would acquire 102 archaeological sites on 12 private inholdings, 57 of which have been initially identified as TCPs. These sites would be afforded greater protection under Federal ownership and management.	•Three of the four eligible sites would be in the residential area. These sites could not be avoided. •The fourth site would be located near the community services, and may possibly be avoided during further site planning. •Sites susceptible to disturbance would require a data recovery plan, developed in consultation with KNF, SHPO, ACHP, and the tribes to ensure that data and information contained in the site is retrieved. •Future development of the private inholdings could result in disturbance or destruction of archaeological sites on those lands. The three private inholdings with the greatest development potential contain 20 sites (TenX = 4 sites, Lower Basin = 16 sites, Kotzin = no sites). •TCPs initially identified to date on the Ten X, Lower Basin, and Kotzin inholdings include 8 Hopi and Zuni sites (with Puebloan or Puebloan/Cohonina affiliation), and two Navajo sites (with three sweat lodges). •The nine remaining inholdings contain 82 sites, 47 of which have been initially identified as TCPs. Although these inholdings are more remote and less likely to be developed, these cultural resources would be afforded little protection under private ownership and management.	•Three of the four eligible sites would be unaffected by development. •The fourth site would be located near the transportation staging area, and may possibly be avoided during further site planning. •Sites susceptible to disturbance would require a data recovery plan, developed in consultation with KNF, SHPO, ACHP, and the tribes to ensure that data and information contained in the site is retrieved. •Future development of the private inholdings could result in disturbance or destruction of archaeological sites on those lands. The three private inholdings with the greatest development potential contain 20 sites (TenX = 4 sites, Lower Basin = 16 sites, Kotzin = no sites). •TCPs initially identified to date on the Ten X, Lower Basin, and Kotzin inholdings include 8 Hopi and Zuni sites (with Puebloan or Puebloan/Cohonina affiliation), and two Navajo sites (with three sweat lodges). •The nine remaining inholdings contain 82 sites, 47 of which have been initially identified as TCPs. Although these inholdings are more remote and less likely to be developed, these cultural resources would be afforded little protection under private ownership and management.

Resource Issue *sub-issue*	**Alternatives**				
	Alternative A: No Action	*Alternative B: Land Exchange Option 1*	*Alternative C: Land Exchange Option 2*	*Alternative D: Townsite Act/Special Use Permit*	*Alternative E: Transportation/Federal Housing*
Biological Resources *Vegetation*	•Existing vegetation on NFS lands would remain under KNF management. •Private inholdings would remain in private ownership and subject to future development. •Up to 674 acres of vegetation (±0.2% of that occurring on District) may be modified on three private inholdings that have the greatest development potential (TenX, Kotzin, and Lower Basin).	•On NFS land proposed for development, 672 acres of vegetation (±0.2% of that occurring on District) may be modified. 112 acres retained as open space (±17% of NFS land proposed for development). •Gain of ± 2,184 acres of vegetation/habitat to the KNF (±0.7% increase in these vegetation types on District) from Federal acquisition of private inholdings.	•On NFS land proposed for development, 380 acres of vegetation (±0.1% of that occurring on District) may be modified. 10 acres retained as open space (±3% of NFS land proposed for development). •Gain of ± 2,184 acres of vegetation/habitat to the KNF (±0.7% increase in these vegetation types on District) from Federal acquisition of private inholdings.	•On NFS land proposed for development, 117 acres of vegetation (±0.04% of that occurring on the District) may be modified. Little area within the proposed development is allocated for open space. •Private inholdings would remain in private ownership and subject to future development. •Up to 674 acres of vegetation (±0.2% of that occurring on District) may be modified on three private inholdings that have the greatest development potential (TenX, Kotzin, and Lower Basin).	•On NFS land proposed for development, 120 acres of vegetation (±0.02-0.03% of that occurring on the District) may be modified. 22.50 acres retained as open space (±29% of NFS land proposed for development). •Private inholdings would remain in private ownership and subject to future development. •Up to 674 acres of vegetation (±0.2% of that occurring on District) may be modified on three private inholdings that have the greatest development potential (TenX, Kotzin, and Lower Basin).
Biological Resources *Wildlife*	•No change in net acres of wildlife habitat under KNF management. •Private inholdings would remain in private ownership and subject to future development. •Development of the inholdings would cause partial displacement and disturbance of local wildlife populations. Development in separate locations would result in a greater total zone of wildlife disturbance than development concentrated in one area. •Wildlife use of up to six ephemeral stock tanks could be eliminated if TenX and Lower Basin inholdings are developed.	•672 acres of wildlife habitat on NFS lands would be modified with zone of wildlife disturbance around development. •Gain of ± 2,184 acres of wildlife habitat would come under Federal ownership and management through the acquisition of private inholdings, including 17 ephemeral stock tanks that provide seasonal water for wildlife (±12% of total number on District).	•380 acres of wildlife habitat on NFS lands would be modified with zone of wildlife disturbance around development. •Acres of habitat gained comparable to Alternative B.	•117 acres of wildlife habitat on NFS lands would be modified with zone of wildlife disturbance around development. •Private inholdings would remain in private ownership and subject to future development. •Development of the inholdings would cause partial displacement and disturbance of local wildlife populations. Development in separate locations would result in a greater total zone of influence to wildlife than development concentrated in one area. •Wildlife use of up to six ephemeral stock tanks could be eliminated if TenX and Lower Basin inholdings are developed.	•95 acres of wildlife habitat on NFS lands would be modified with zone of wildlife disturbance around development. •Private inholdings would remain in private ownership and subject to future development. •Development of the inholdings would cause partial displacement and disturbance of local wildlife populations. Development in separate locations would result in a greater total zone of influence to wildlife than development concentrated in one area. •Wildlife use of up to six ephemeral stock tanks could be eliminated if TenX and Lower Basin inholdings are developed.

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Biological Resources *Special Interest Species*	•Known habitat for Tusayan flameflower and possible habitat for northern goshawk, flammulated owl, and Navajo Mountain Mexican vole on NFS land involved in analysis would remain under Federal ownership and management. •40 Arizona leatherflower plants (13% of known population on the District), 470 Tusayan flameflower plants (<3% of known population on the District), and possible habitat for northern goshawk, flammulated owl, Navajo Mountain Mexican vole, and occult little brown bat could be impacted or destroyed by development of private inholdings.	•152 Tusayan flameflower plants (1% of the known population on the District) and possible habitat for northern goshawk, flammulated owl, and Navajo Mountain Mexican vole could be impacted or destroyed by development of the NFS land. •40 Arizona leatherflower plants (13% of known population on the District), 470 Tusayan flameflower plants (<3% of known population on the District), and possible habitat for northern goshawk, flammulated owl, Navajo Mountain Mexican vole, and occult little brown bat on the private inholdings would come under Federal ownership and management.	•Similar to Alternative B, except 135 Tusayan flameflower plants (< 1% of the known population on the District) could be impacted or destroyed by development of the NFS land.	•No Forest Service sensitive plants affected. Possible habitat for northern goshawk, flammulated owl, and Navajo Mountain Mexican vole could be impacted or destroyed by development of the NFS land. •40 Arizona leatherflower plants (13% of known population on the District), 470 Tusayan flameflower plants (<3% of known population on the District), and possible habitat for northern goshawk, flammulated owl, Navajo Mountain Mexican vole, and occult little brown bat could be impacted or destroyed by development of private inholdings.	•100 Tusayan flameflower plants (< 1% of the known population on the District) and possible habitat for northern goshawk, flammulated owl, and Navajo Mountain Mexican vole could be impacted or destroyed by development of the NFS land. •40 Arizona leatherflower plants (13% of known population on the District), 470 Tusayan flameflower plants (<3% of known population on the District), and possible habitat for northern goshawk, flammulated owl, Navajo Mountain Mexican vole, and occult little brown bat could be impacted or destroyed by development of private inholdings.

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KNF Management *Management Objectives*	•Potential loss of six stock tanks on the TenX and Lower Basin inholdings, if developed. •KNF continues to manage watershed conditions on NFS lands. Watershed conditions on the private inholdings continue to be affected by existing uses. •Existing special uses unaffected. Continued demand for additional special use permits and encumbrances for utilities, services, and facilities on NFS land surrounding Tusayan and the private inholdings. •Continue current boundary management practices and procedures. Value of private inholdings may increase over time and an opportunity to acquire them may be lost because of increased value or possible development	•Loss of 672 acres of NFS land from the Rain Tank allotment, although no change in permitted number of livestock on this or other allotments would occur. Federal acquisition of 17 stock tanks associated with private inholdings. Gain of roughly 2,184 acres of rangeland on the Tusayan Ranger District. •No increase in peak flow or sediment concentrations in regional waters from development of NFS land. •KNF management of soil and vegetation on acquired private inholdings could improve watershed conditions. •Existing utility corridor rights-of-way reserved in exchange. CFV development may increase use of Moqui Lodge and Apache Stables from increased visitors to area, but would not influence continued operations of these facilities under special use permits. CFV development near Moqui Lodge would create opportunity for sharing infrastructure, particularly wastewater treatment facilities. •About 4 miles of new boundary and up to 10 new property corners associated with development of NFS lands. Net decrease of 34 miles of boundary and 121 property corners on the Tusayan Ranger District with Federal acquisition of private inholdings.	•Similar to Alternative B, except loss of 380 acres from the Rain Tank Allotment, and about 3 miles of new boundary and up to 8 new property corners associated with development of NFS lands. Net decrease of 35 miles of boundary and 123 property corners on District with Federal acquisition of the private inholdings.	•Loss of 117 acres of NFS land from the Rain Tank Allotment, but no change in the permitted number of livestock on this allotment would occur. Potential loss of six stock tanks on the TenX and Lower Basin inholdings, if developed. •KNF continues to manage watershed conditions on NFS lands. Watershed conditions on the private inholdings continue to be affected by existing uses. •Existing special uses unaffected. Continued demand for additional special use permits and encumbrances for utilities, services, and facilities on NFS land surrounding Tusayan and the private inholdings. •Continue current boundary management practices and procedures. Value of private inholdings may increase over time and an opportunity to acquire them may be lost because of increased value or possible development. •Net increase of about 2 miles of new boundary and 11 property corners on the Tusayan Ranger District.	•Loss of 120 acres of NFS land from the Rain Tank Allotment, but no change in the permitted number of livestock on this allotment would occur. •KNF continues to manage watershed conditions on NFS lands. Watershed conditions on the private inholdings continue to be affected by existing uses. •Existing special uses unaffected. Continued demand for additional special use permits and encumbrances for utilities, services, and facilities on NFS land surrounding Federal housing, transportation staging area, Tusayan, and the private inholdings. •Continue current boundary management practices and procedures. Value of private inholdings may increase over time and an opportunity to acquire them may be lost because of increased value or possible development. •Net increase of about 1 mile of new boundary and 3 property corners on the Tusayan Ranger District

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KNF Management *Public Recreation Opportunities*	•Current recreational use of NFS land would continue. •Dispersed recreational use could be eliminated or restricted on the private inholdings, particularly those with the greatest development potential. •Camper Village RV park and campground (250 sites) would be closed and land developed into mixed-use commercial facilities. •Expansion of TenX Campground by another 150 camp sites could occur as proposed by the KNF. This would absorb some of the demand created from closing of Camper Village RV park and campground, but may not entirely satisfy total demand for camping in the Grand Canyon/Tusayan area. •Two orientation/interpretive centers may be built on private land, INSIGHT (by CFV and the Museum of Northern Arizona) and the orientation/interpretative center developed by Destination Cinema (potentially in conjunction with the National Geographic Society). Visitors would pay to use both facilities. •No change in the total acres of various Recreation Opportunity Spectrum (ROS) classifications on NFS land would occur.	•Opportunities for dispersed recreation eliminated on 672 acres of NFS land. •Dispersed recreational use could continue on 2,184 acres of the private inholdings acquired through exchange. •Development of 250 site RV/campground in CFV development. •KNF may pursue expansion of TenX Campground, by an additional 150 units as proposed. •INSIGHT built in CFV development. Visitors would pay to use this facility. •Increase of 160 acres of Semi-Primitive Motorized ROS area and 2,024 acres of Roaded Natural ROS area on the Tusayan Ranger District. •Development of another orientation/interpretive center could occur with redevelopment of Tusayan.	•Similar to Alternative B, except opportunities for dispersed recreation eliminated on 380 acres of NFS land.	•Opportunities for dispersed recreation eliminated on 117 acres of NFS land. •Camper Village RV park and campground (250 sites) would be closed and land developed into mixed-use commercial facilities. •Orientation/interpretive center built adjacent to redesigned IMAX theater. Visitors would pay to use this facility. •Expansion of TenX Campground by another 150 camp sites could occur as proposed by the KNF. This would absorb some of the demand created from closing of Camper Village RV park and campground, but may not entirely satisfy total demand for camping in the.Grand Canyon/Tusayan area. •Decrease of 117 acres of Roaded Natural ROS area on the Tusayan Ranger District. •Development of INSIGHT could occur on one of the private inholdings.	•Opportunities for dispersed recreation eliminated on 120 acres of NFS land. •Dispersed recreational use could be eliminated or restricted on the private inholdings, particularly those with the greatest development potential. •Camper Village RV park and campground (250 sites) would be closed and land developed into mixed-use commercial facilities. •Expansion of TenX Campground by another 150 camp sites could occur as proposed by the KNF. This would absorb some of the demand created from closing of Camper Village RV park and campground, but may not entirely satisfy total demand for camping in the Grand Canyon/Tusayan area. •Two orientation/interpretive centers may be built on private land, INSIGHT (by CFV and the Museum of Northern Arizona) and the orientation/interpretation center developed by Destination Cinema (potentially in conjunction with the National Geographic Society). Visitors would pay to use both facilities. •Decrease in 120 acres of ROS area on the Tusayan Ranger District designated as Roaded Natural.

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KNF Management *Fire Management Programs*	•Potential development of private inholdings would result in increased wildland/urban interface and increased fire risk from new development in areas previously undeveloped. Scattered development could affect fire response time and emergency services.	•Increase wildland/urban interface in the Tusayan area from the development of 672 acres of NFS land. Development concentrated in one area would allow fire management programs to be more efficient. •CFV would build and equip a permanent fire station for Tusayan.	•Same as Alternative B, except size of CFV development is 380 acres.	•Increase wildland/urban interface in the Tusayan area from the development of 117 acres of NFS land. •Potential development of private inholdings would result in increased wildland/urban interface and increased fire risk from new development in areas previously undeveloped. Scattered development could affect fire response time and emergency services. •Land would be available for sale to Tusayan Fire District on Townsite land to build a permanent fire station.	•Increase wildland/urban interface in the Tusayan area from the development of 120 acres of NFS land. •Potential development of private inholdings would result in increased wildland/urban interface and increased fire risk from new development in areas previously undeveloped. Scattered development could affect fire response time and emergency services.

Your Comments

This space is provided so you can conveniently provide your comments on the Executive Summary of the Draft Environmental Impact Statement for Tusayan Growth. Be sure to include your name and address so your comments can be included in this analysis process. **Please note your comments must be postmarked by the date stamped on the inside front page of the Executive Summary.**

Your Name: ______________________________

Address: ______________________________

Comments: ______________________________

Please detach, fold, and mail to address on reverse

See other side for suggestions for providing effective comments

Tips for Providing Comments...

This is a chance for you to examine options for planned community growth and development. We need to hear your concerns, ideas and suggestions.

For your comments to be useful, consider the following:

What are you really concerned about?

Be as specific as possible. Tell us what you like or dislike about the alternatives and why. This is not a "voting" process--simply saying "I don't like this idea" doesn't provide us with enough information to follow up on your concerns.

Did we miss something?

Are there other potential impacts we haven't examined here that need to be considered?

Do you have some suggestions?

Are there other ways to avoid, prevent, or reduce impacts that we haven't discussed?

What do you know?

Do you have some additional information that would be valuable to the Interdisciplinary Team conducting a thorough analysis of the Tusayan Growth issues and alternatives?

Return Address:

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